Technology Driven Disruption and the Building Industries – Future Trends

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Director, CASE
DENNIS SHELDEN AIA PHD

Academic

MIT
• BS Architectural Design ‘88
• MS Civil & Environmental Eng.
• PhD in Design Computation

Assoc. Professor of Practice 2005–2015

UCLA, SCIARC, UCB,…

Georgia Tech
Director, Digital Building Lab Apr. 2016

Professional

Technology Director for Frank Gehry, 1997

CTO Gehry Technologies 2002-2014
THE BUILDING INDUSTRY PAST

LARGE

$ 200T assets
$ 10T global expenditure

FRAGMENTED

LOW MARGIN & PRODUCTIVITY

REGIONAL

SLOW TO EVOLVE
BIM / VDC’S impact has been incremental or niche

Advances have been for professionals,
Created push but not pull
NEXT GENERATION WILL PROFONDLY IMPACT:

- Economics of delivery models
- Relationship to capital
- Relationship between professionals, consumers and the environment
WHY NOW?

MOORE’S LAW
PENT UP DEMAND & OPPORTUNITY
EXPANDING SUPPLY
IOT & UBIQUITOUS COMPUTING
NEW INTEGRATORS

“HARD PROBLEMS”
Tech disruption - characteristics

• Take on fragmented industries by integrating a number of traditionally distinct capacities in a supply chain into a single enterprise and business model, often streamlining the internally integrated process, “reducing friction” across these steps, and monetizing multiple distinct offerings into a single service.

• Use technology – specifically data driven technology – as a way of streamlining cross process operations, supporting capacity to scale non-linearly (reducing the marginal costs of each additional customer or engagement).

• They capture data that is normalized by large scale repetition of process, and can use this data to pinpoint and test variations in process and product to continuously improve.

• Their integrated supply chains connect to the customer and end users, and they are able to use data both about and for their customers to maintain continuous long term relationships.

• They frequently operate as hybrid product – services companies: traditional one-of purchases are delivered though ongoing procurement and services.

• Many have capital driven scaling as business driver, with scaling prioritized over short term profitability. The scaling of these business models is quite different from the aggregative “roll-up” models prevalent in some sectors of the building industry.
Introducing the next generation of housing.
Alloy

CHANGE ORDER

Date: March 4, 2014

PROJECT

Owls'beak Townhouses
55 Pearl Street
Brooklyn, NY 11201

OWNER

55 Pearl Street LLC
Owls'beak Development Holdings
20 Jay Street, Ste. 1003
Brooklyn, NY 11201

The Contract is changed as follows:

As per the attached Euro Form invoice/##023525/7/1 dated 3/25/14, RSA-CBH-#688, #1318, #1318, #1318, the approved record set of structural steel shop drawings dated 2/12/14 and correspondence from RSA between 3/21 - 3/25:

Fabrication and installation of additional (6) HSS 5x3x5/8" columns and (5) W32x29 beams at Grid 'A', and (4) C12x255 channels at Penthouse Terrace framing at North Skylights

Fabrication and installation of (24) web stiffeners at Mezzanine perimeter W21x83 and W16x48 beams at floor level plate locations

Additional detailing due to said revisions

Subtotal: $12,820.00
Overhead and Fee (15%): $1,920.00
Insurance (0%): $0.00
TOTAL CHANGE ORDER: $14,740.00

The new Contract Sum including this Change Order will be $16,800.00.

The contract time will be increased by 2 days.

NOTValid until signed by the architect, construction manager, and owner:

ACG Design LLC
CONSTRUCTION MANAGER (Type name)
20 Jay Street, Ste 1003, Brooklyn 11201

OWNER

55 Pearl Street LLC
20 Jay Street, Ste 1003, Brooklyn 11201

ARCHITECT (Type name)

36 Pearl Street LLC

ADDRESS

ADDRESS

Jared Delia Valla

Jared Delia Valla

DATE

DATE

( Typed Name)

( Typed Name)

10/1/2014

2/12/2014

2/12/2014
CYBER-PHYSICAL WORLD VIEW

DESIGN
ENGINEER
BUILD
OPERATE
EXPERIENCE
Start Now. Scale When You're Ready.

Temperature Monitoring
Protect your assets with real-time temperature monitoring.
LEARN MORE

Asset Tracking
Enable workflow optimizations, real-time inventory management, and location services.
LEARN MORE

Facilities Management
Manage facilities with a consolidated view into your operations.
LEARN MORE

Predictive Maintenance
Avoid business disruptions and costly downtime.
LEARN MORE

Platforms including Microsoft Azure, Amazon AWS, and Oracle Cloud.
Platforms to deliver tailored, industry-specific solutions.
Including support for inventory and asset management.
and customize alerts, allowing you to launch pilots and scale with minimum time to market.

VIEW PRODUCTS
Retail design studio
THE DISRUPTORS

TECHNOLOGY-DRIVEN ARCHITECT-ENTREPRENEURS

Guest-edited by DENNIS SHELDEN

ARCHITECTS’ vision and persistence means they are poised to become innovators. Yet they are trained to believe their work is finished with the creation of an original idea, meaning they lack entrepreneurship.

Managing Editor: PAUL BOSBY

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The architect needs to be a cultural entrepreneur: interested in business, but also with a genuine fascination for culture.

Technology is increasing – not decreasing – the demand for the social aspects of architecture & design.
Front ultimately [pulled] out of the contracting business and instead leveraged all of the knowledge that had been acquired – in logistics, scheduling, costs, procurement, means and methods, and detailed systems design, analysis, automation and quality control – emerging as an augmented and comprehensive building envelope design, engineering and consulting practice.

Front’s evolution as a firm and the skill set gained through this evolution are what enable it to now take on [humanitarian] projects. As a global consulting practice, this capacity starts with a holistic understanding of the kinds of problems of envelopes, identification of needs, the ability to build relationships and to create the circumstances under which one can actually act, and ultimately to carry a project to realization.
THE DISRUPTORS
A SYMPOSIUM ON BUILT ENVIRONMENT ENTREPRENEURSHIP
MAY 8-11, 2020
NEW YORK CITY

The building industries are entering a period of radical transformation. Startups are proliferating. Traditional architecture and engineering firms are creating incubators and spin-offs. Tech companies are becoming interested in the built environment as the next platform for technological and economic disruption. New careers are emerging for architects beyond building design.

Join leading architects, startups, investors and visionaries for a conversation and celebration of disruptive technologies and the future of the built environment.

Panels include:
FIRM LEADERS FUTURISTS
DESIGNERS STARTUPS
NEW BUILDERS INVESTORS
DEVELOPERS INCUBATORS


Presented by: Center for Architecture Science and Ecology WILEY Rensselaer