IDEAbuilder

The future of building, building the future.
Industry 4.0 in AEC

First Industrial Revolution
through the introduction of mechanical production facilities with the help of water and steam power
First mechanical loom, 1784

Second Industrial Revolution
through the introduction of a division of labor and mass production with the help of electrical energy
First assembly line Cincinnati slaughter houses, 1870

Third Industrial Revolution
through the use of electronic and IT systems that further automate production
First programmable logic controller (PLC), Modicon 084, 1969

Fourth Industrial Revolution
through the use of cyber-physical systems

Degree of complexity

Time
$900 Billion for Industry 4.0 versus $128.5 billion VC investments


In 2015 VC-backed companies raised

$128.5B across 7872 deals

Source: VentureBeat
Digitizing the $217 Trillion Global Real Estate Industry

• Market Size and Opportunity
• State of the Industry – Inefficient and Change Resistant
• Technology and global best practices
• Washington State – Competitive and Comparative Advantages – Epicenter of Innovation?
• Who and How – Hacking together tech and AEC.
Why Digitization?

Construction
- Waste: 57%
- Value Added: 10%
- Support Activities: 33%

Manufacturing
- Waste: 12%
- Support Activities: 26%
- Value Added: 62%

Source: US Bureau of Labor and Statistics
Pacific Northwest Opportunity

• World’s Largest Producer, Exporter, Importer and Market of Wood.
• Majority of wood used for Housing
• Washington and Oregon are the largest wood producing states – BC the biggest province.
• Vancouver, Seattle and Portland are the fastest growing and appreciating cities in North America.
Wooden Houses
90% Market Share in U.S.

New housing is the biggest market for wood.

About one third is used for repairs and remodeling.

According to the Western Wood Products Association, over 90% percent of American homes are built with wood.

In Europe approximately 10% of homes are wood-framed, except in Scandinavia where wood is more common.

18-Story Brock Commons in Vancouver, BC
Photo taken September 16, 2016.
Consumption of Wood

Key:

This shape represents 100 million cubic meters. Round Wood Equivalent volume. Areas shown are directly proportional to volume. Top 25 countries shown.


© 2013 Autodesk
Production of Wood

Key:
This shape represents 100 million cubic meters. Areas shown are directly proportional to volume. Top 25 countries shown.

Source: "FAO STAT", FAO 2001
Krusi 5 Axis Wood CNC
TED Pop-Up Theater
Architect: Rockwell Group
AEC Hackathons
Architecture, Engineering and Construction

Past AEC Hackathons
Silicon Valley (3)
Seattle (3)
New York City (2)
Chicago (2)
Dallas
Southern California (2)
London (2)
Helsinki (3)
Philadelphia
Singapore (2)
Austin
Stamford, Connecticut
Paris

Future AEC Hackathons
Singapore
Shanghai
Silicon Valley
Denmark-Sweden
Helsinki
Seattle
London
New York City
Southern California
Munich
Egypt
Austin
Singapore
Ireland
Washington DC
Digital Fabrication Network

dFab Net is an international network comprised of digital fabricators; hardware and software suppliers; and professional designers, academics, and researchers, all working together to improve processes and accelerate digital fabrication.
Digital Fabrication – Material Agnostic

**SFMOMA - Composites**

**Wooden Museum, France**

**Robotically Printed Metal Bridge, Holland**

**Metal Stadium, Dubai**