



AEC Verge Media copyright

# Disruption & Transformation

The convergence of BIM, Lean, Sustainability & Collaborative/ Integrated Project Delivery Methods

James McKenzie

Executive Director, AEC Verge

Autodesk University, 2014



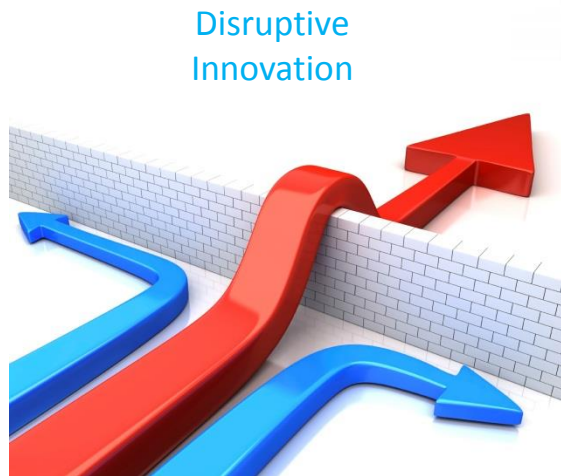
# Coming Out of our Silos-What's Going On?



- Rebuilding from the Great Recession
- Our new connected world
- Networks are now critical

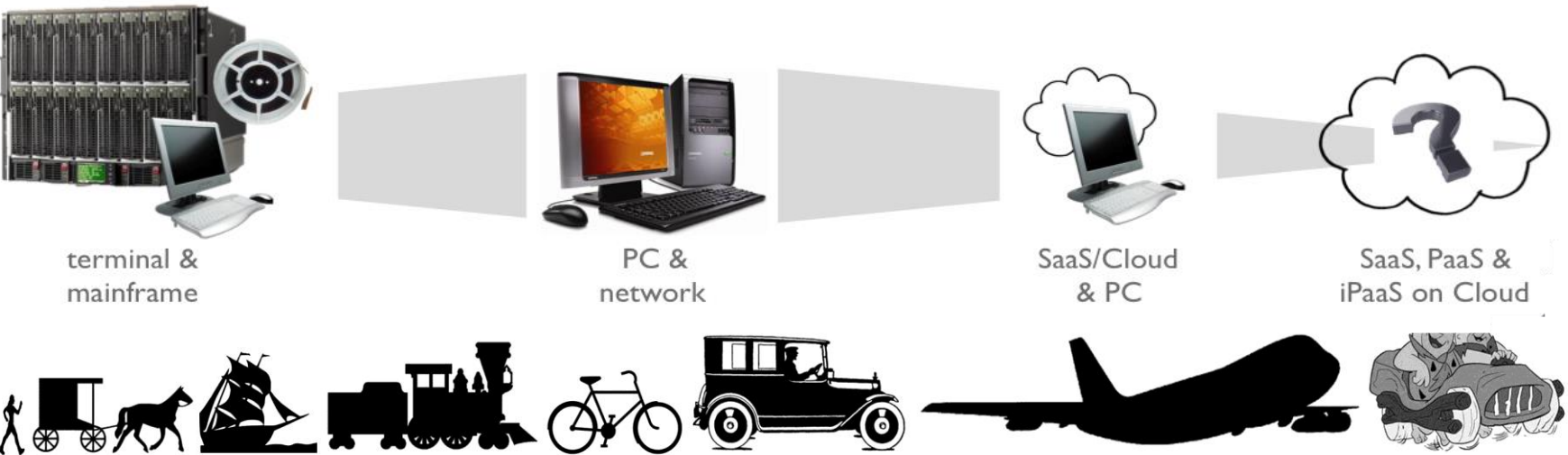
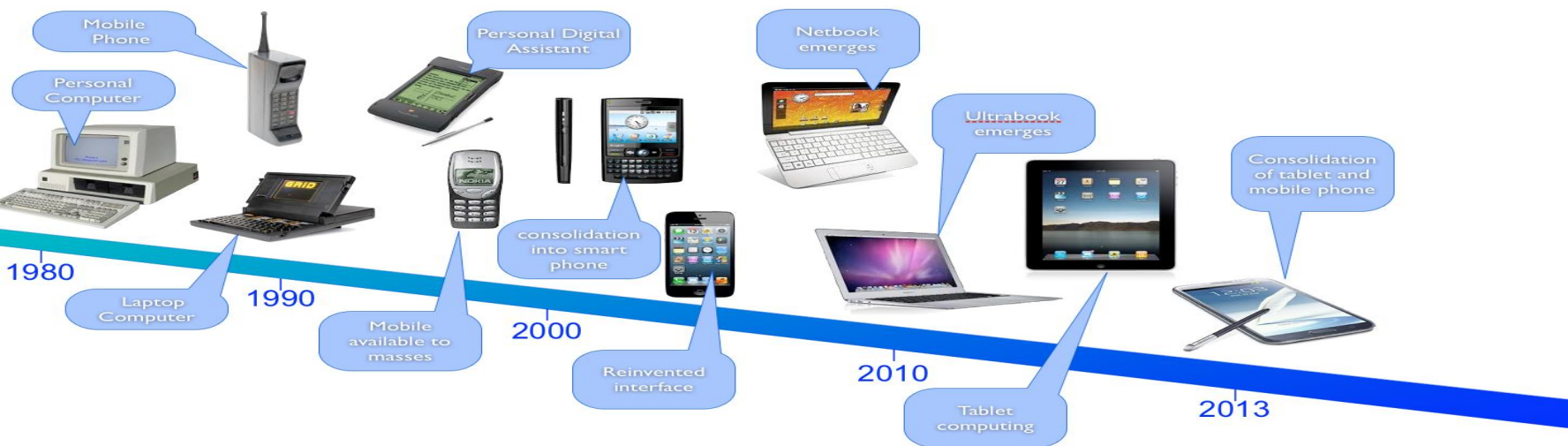


# What is Industry Disruption?



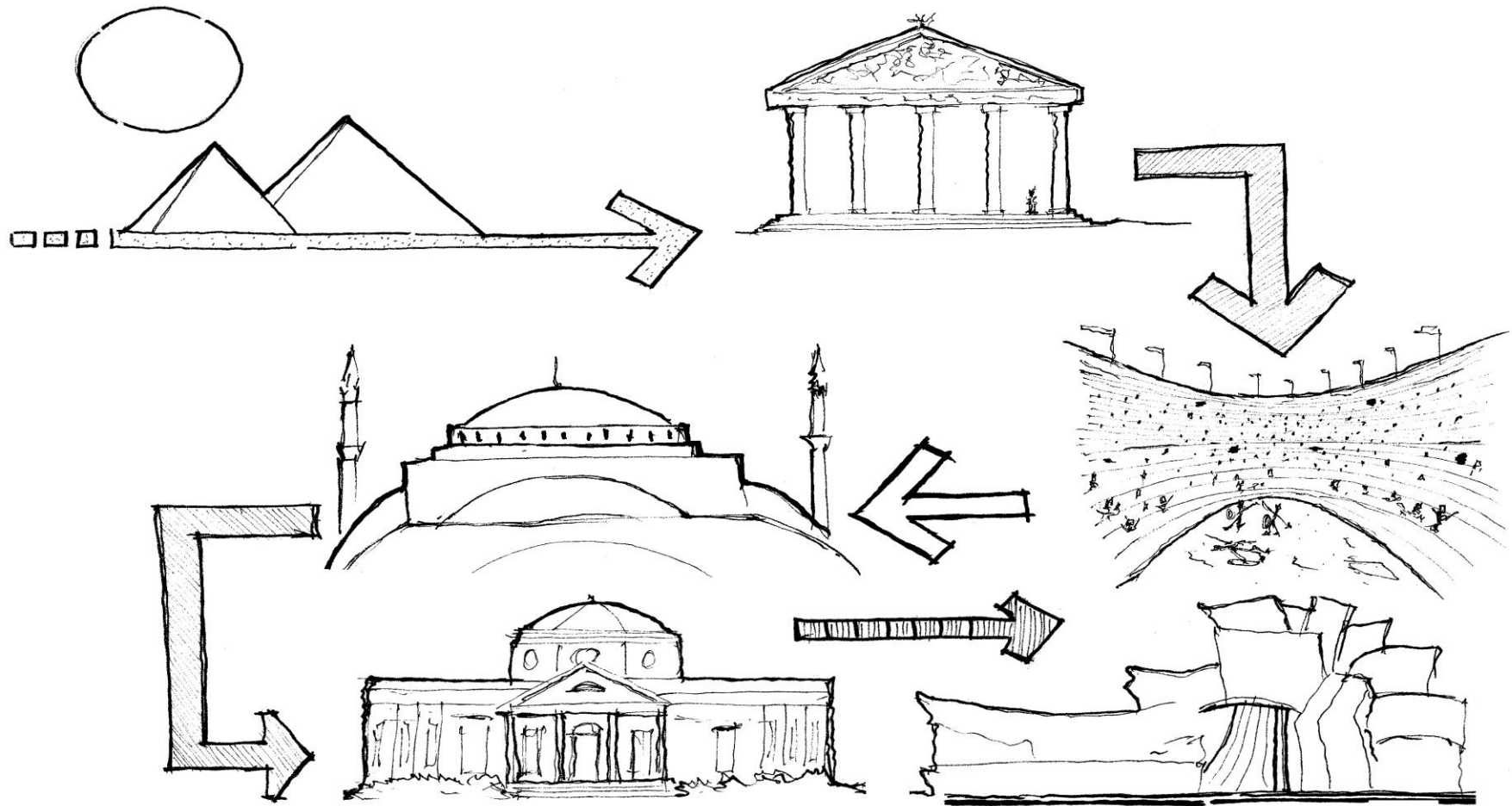
- Innovation drives disruption
- Sustaining Innovation-does not affect existing markets (e.g., CAD)
- Evolutionary Innovation-Improves a product in an existing market
- Revolutionary-unexpected but does not affect existing markets
- Disruptive-Innovation creates a new market

# Classic Technological Disruptions and Resulting “Road Kill”



- Horse and Buggy vs. Automobile
- Steam Locomotive vs. Diesel
- Locomotive vs. Airplane
- Passenger steamship vs. commercial jetliner
- Mainframe vs. personal computer
- PC vs. mobile/cloud computing

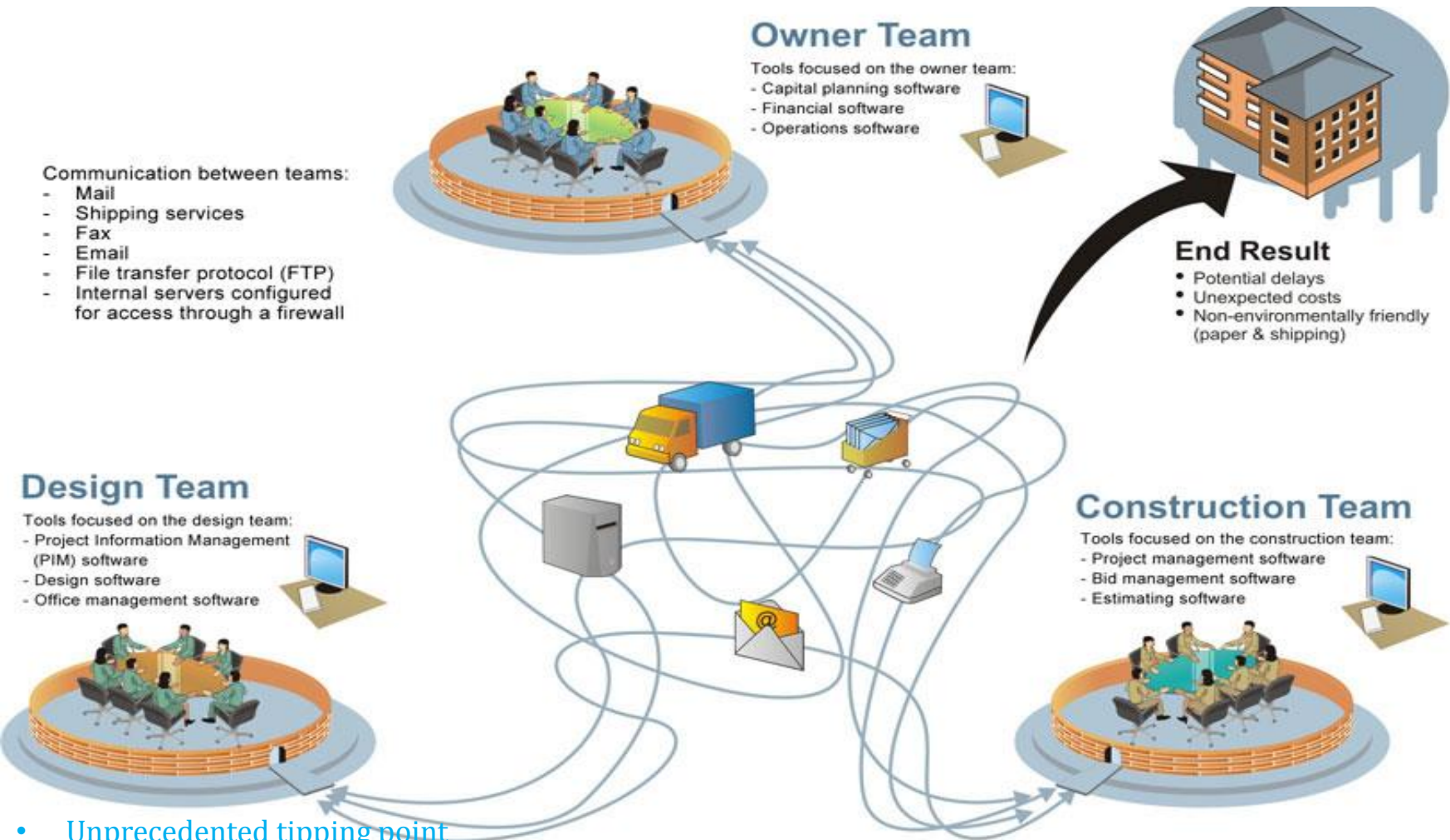
# Classic AEC Industry Disruptions



- Building materials and geometric shapes
- Gothic period
- Industrial revolution
- Skeletal frame buildings & the curtain walls system
- Modernism
- CAD

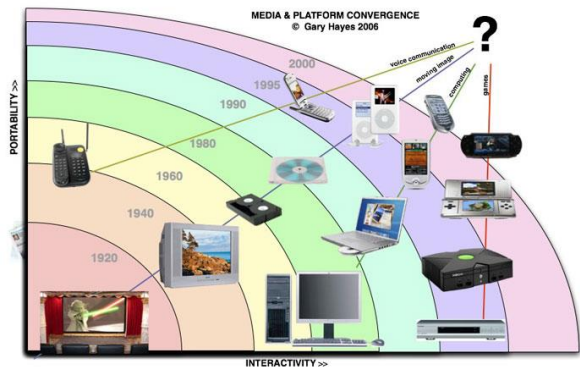
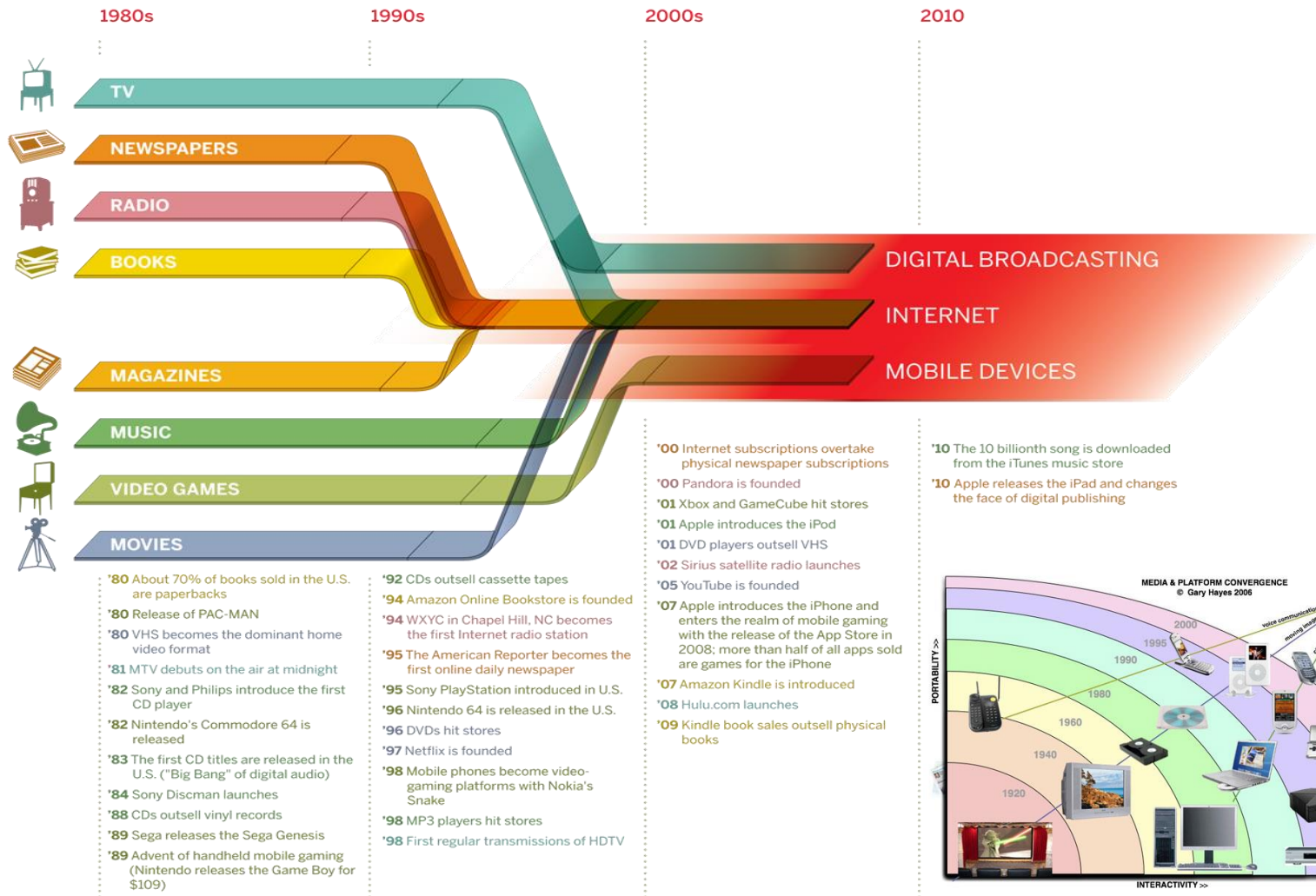


# Where is our industry now?



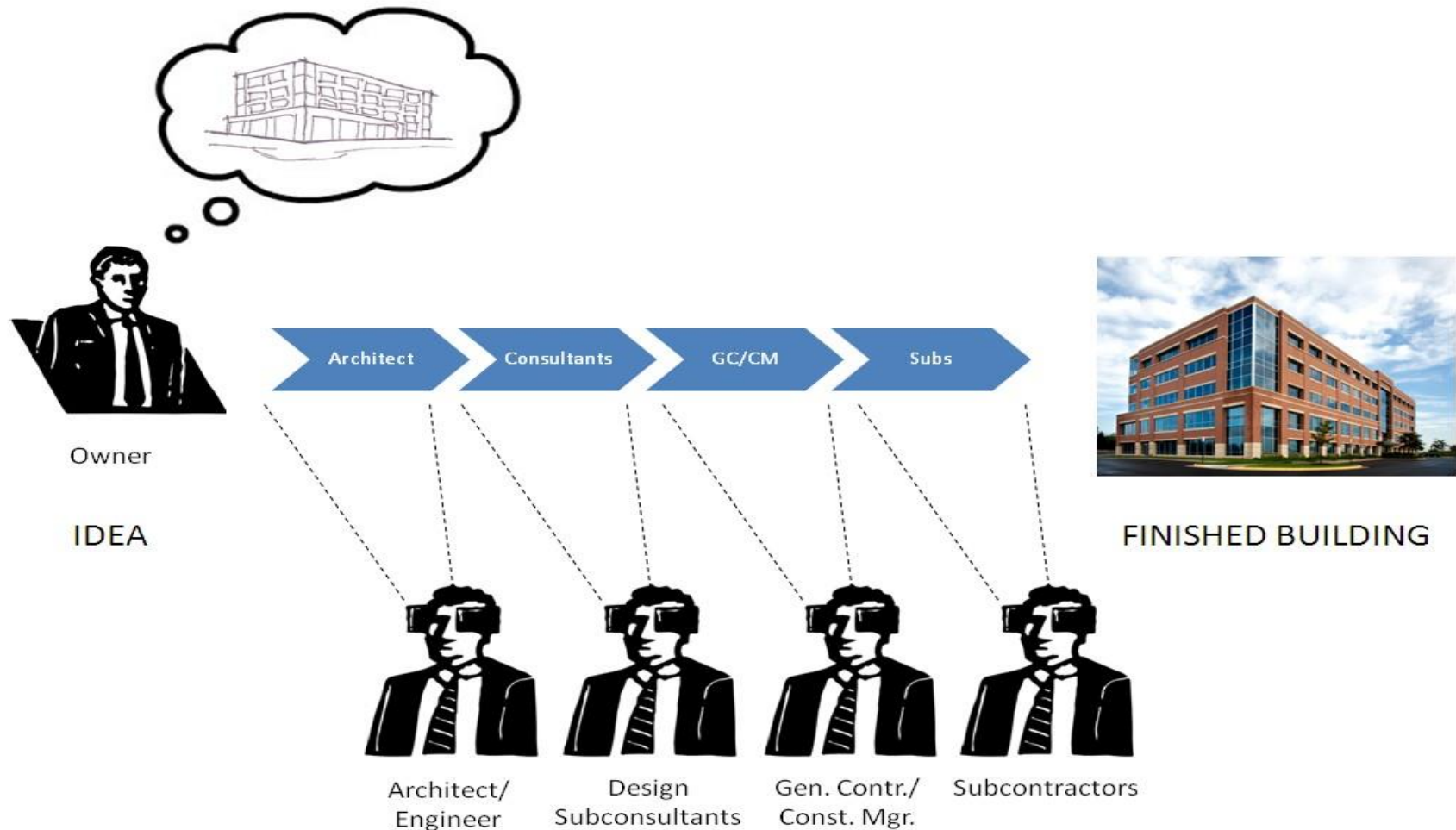
- Unprecedented tipping point
- Not going back to business as usual
- Mergers and Acquisitions
- Non-traditional and global competition
- Architects hit a “plateau” with BIM while builders see “unlimited opportunities”

# Technology & Process Convergence



- Ability to create something new by combining two or more technologies or processes
- In the future anything is possible with digital convergence?

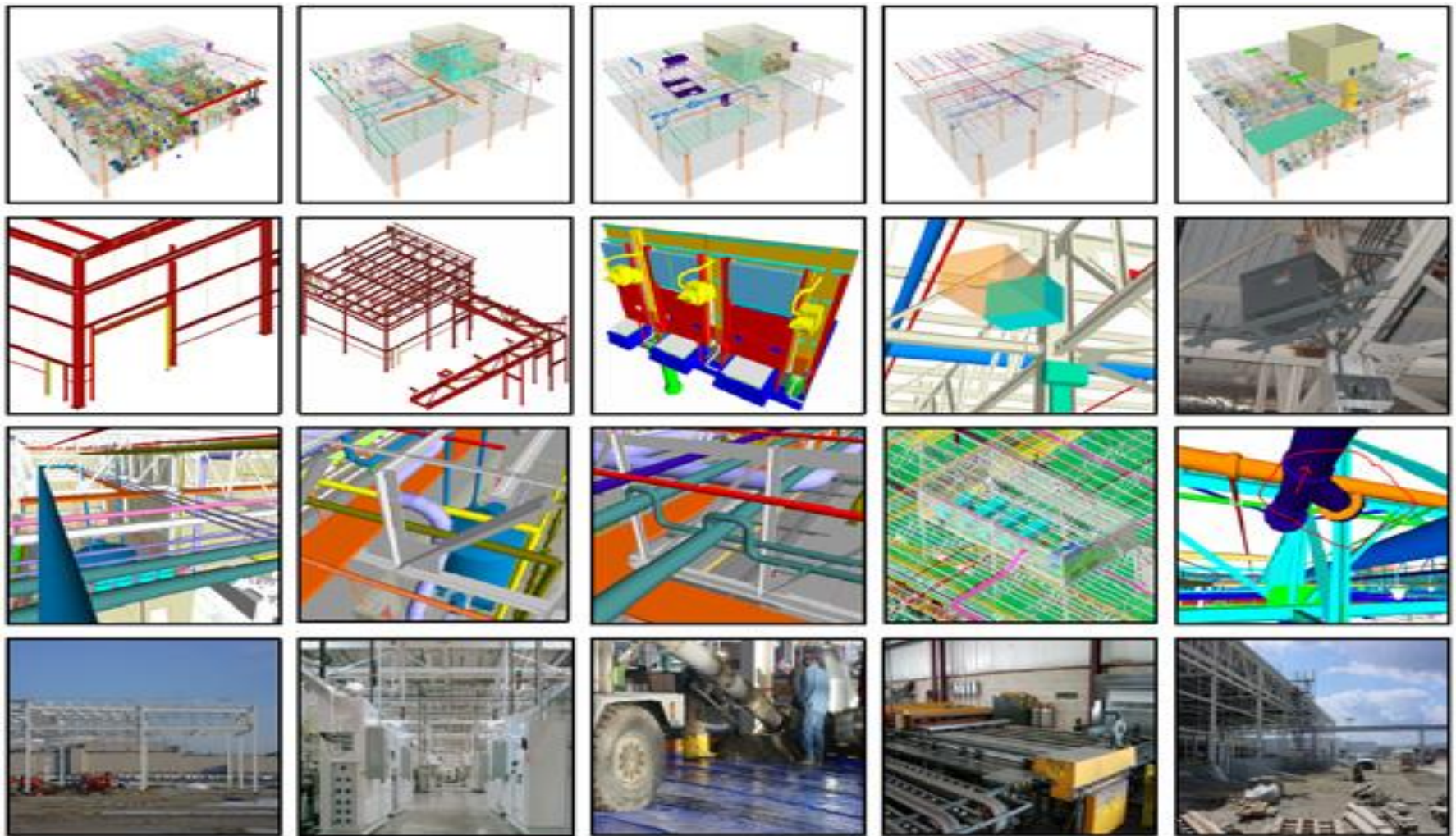
# “The Owner’s Dilemma”



- Owner's carry all the risk for building performance
- Project delivery method is determined by the owner
- Project success is won or lost during the planning stage
- Demand high performance for the lowest possible cost
- Quality of PM staff varies considerably



# BIM Overview: Where Information Meets Geometry



- Cognitive shift in the way design is done
- Fosters Early decision making based verifiable and quantifiable data
- Advanced analysis based on a model

# Lean Construction- It's all about reducing waste



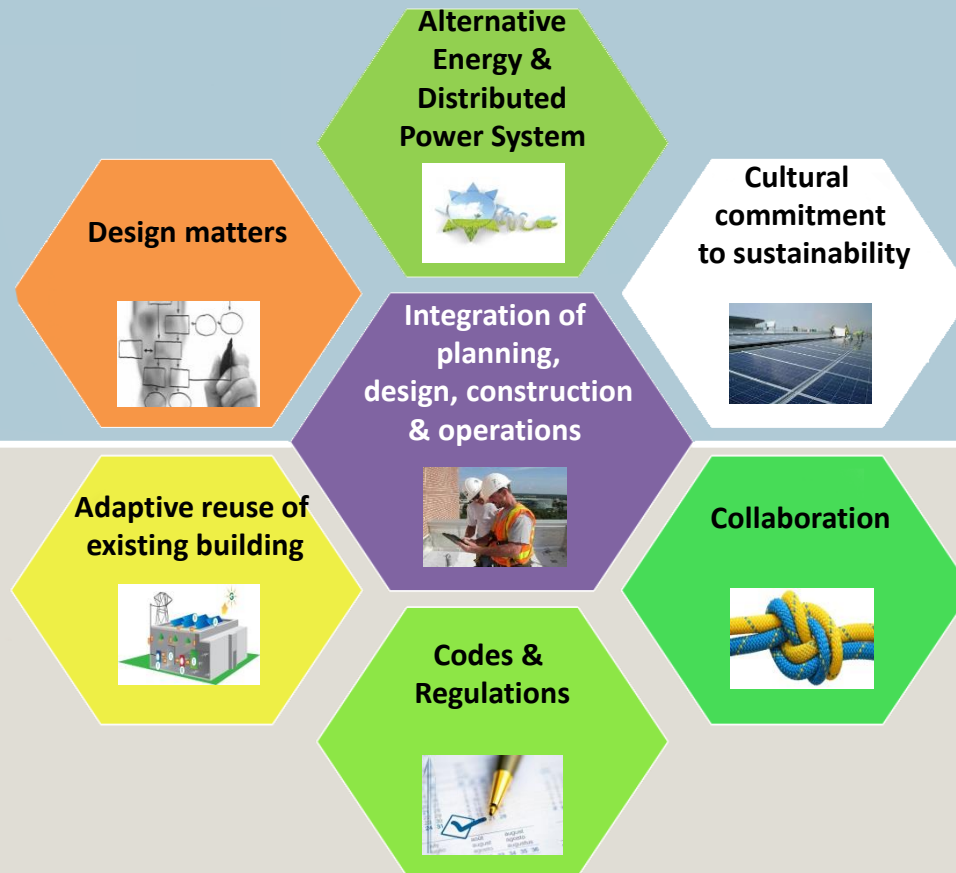
**LEAN:** Forethought | proactive vs reactive | early intensive sessions of client + designer programming, questions & test solutions to clearly define the real goals + solutions prior to beginning the journey | minimize revisions during construction | inspiration to realization | ability + agility | less is more | learn from the past, build for today, plan for tomorrow | be smart, think smart, work smart, to create smart solutions with rigor + vigor.

**DREAM:** Zen | to be problem solvers & dream weavers | dream big & fearlessly ask "what if ?" | always create a sense of place that engages all the human senses | reveal a place that is instantly recognizable, stimulating the conscience and quietly touching the observer's innate intuition | the promise of celebrating the particularity of place, time + user | to make the client's dreams come true.

**GREEN:** Recycle, reuse, repurpose | site specific & responsive design | symbiotic relationship with Mother Nature | think globally, buy locally | "pay it forward" sustainability approach | celebration of the elements : sun, air, fire, water & earth | lifecycle cost & longterm return on investments | carbon footprint & energy efficiency | flexible multitasking space planning | seamless holistic dialogue between exterior & interior spaces | living rooftop landscaping or gardens to replant in the sky what's be taken from the ground.

- Cultural shift
- Process improvement
- Reduce waste:
  - Human energy, material waste, Energy, Financial

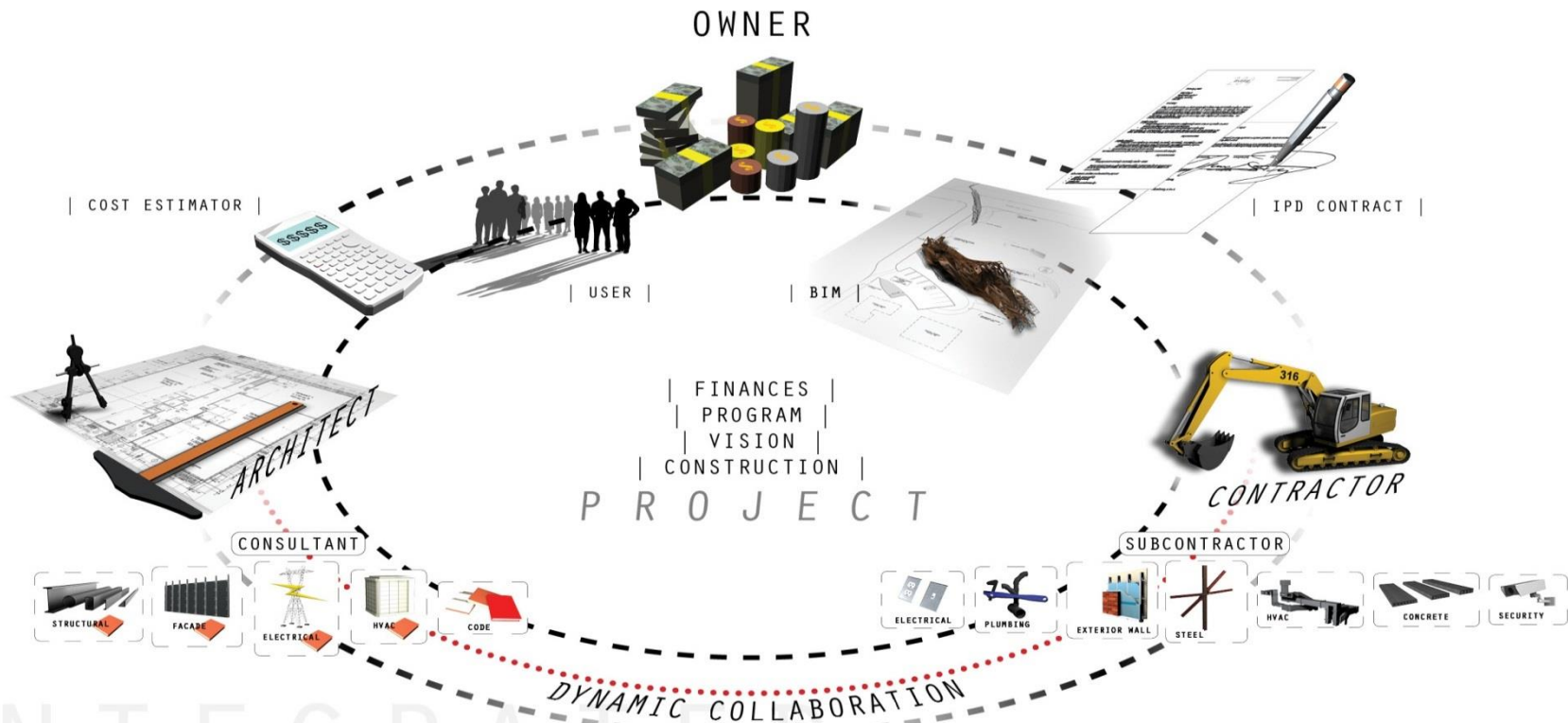
# Sustainable Design- Going Way Beyond Just Being Green and LEED



- Optimal results when using BIM
- Must be done during conceptual and schematic design
- Very sophisticated tools now available
- Requires a systems approach
- Life cycle costs reduction
- New construction and renovation

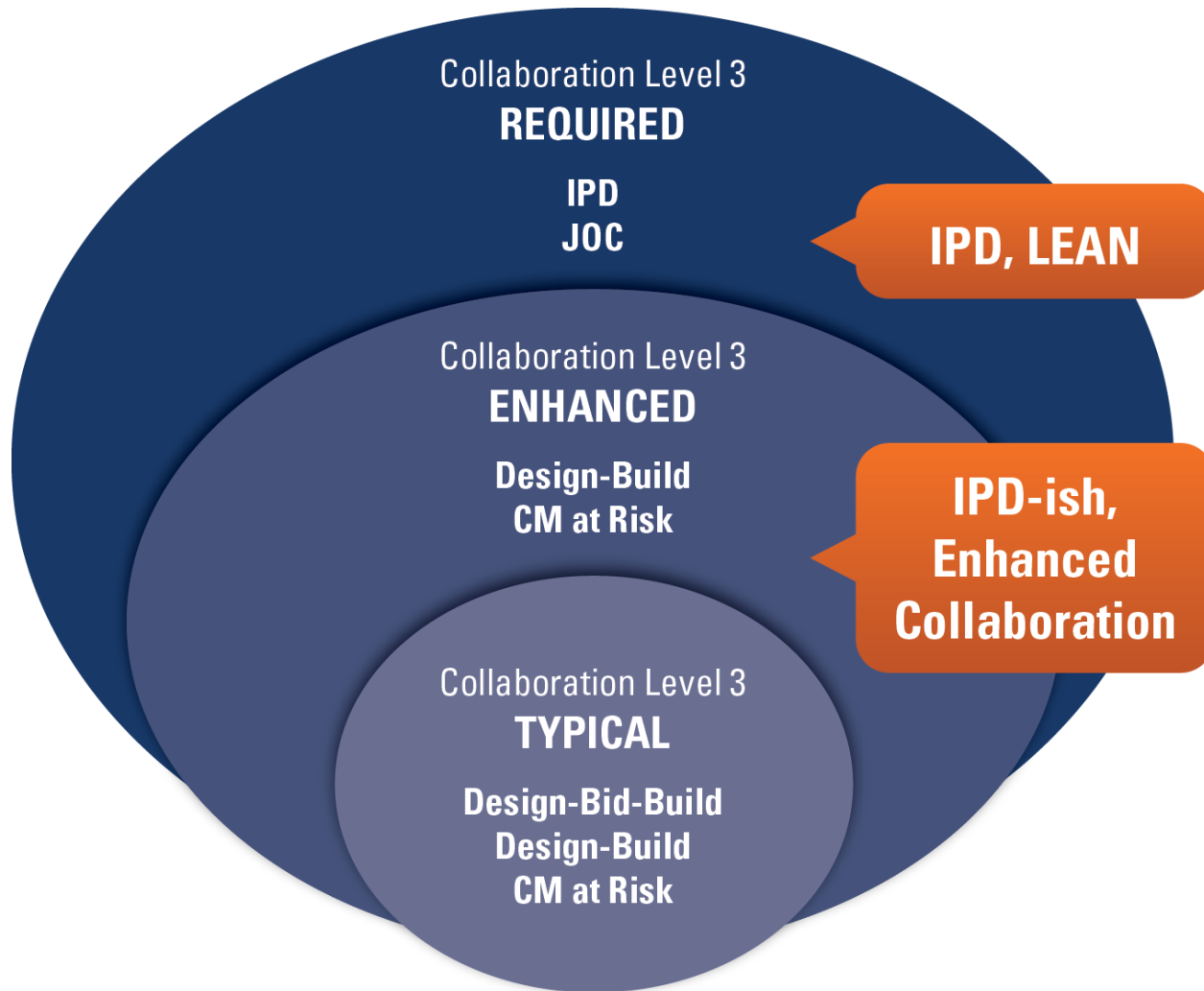


# IPD and Its Variations- Collaboration and Integration is at the core



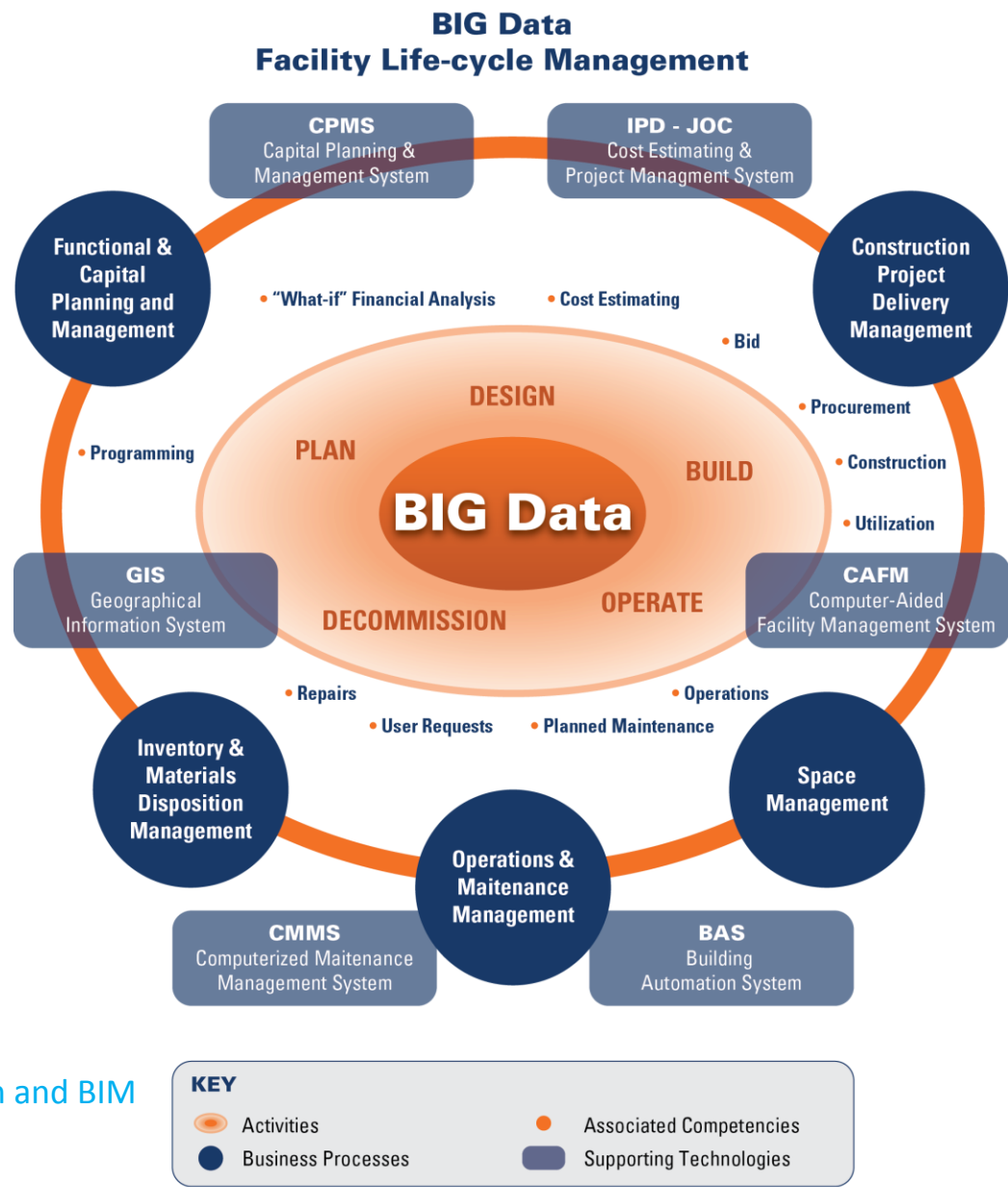
- Team building
- Shared risk/reward (optional?)
- Authentic collaboration needed
- Integration of planning, design, fabrication, construction/installation and FM

# The convergence of BIM, Lean, Sustainable Design and IPD



- Separate processes
- Developed independently
- Designed to solve specific industry problems
- Excellence through convergence

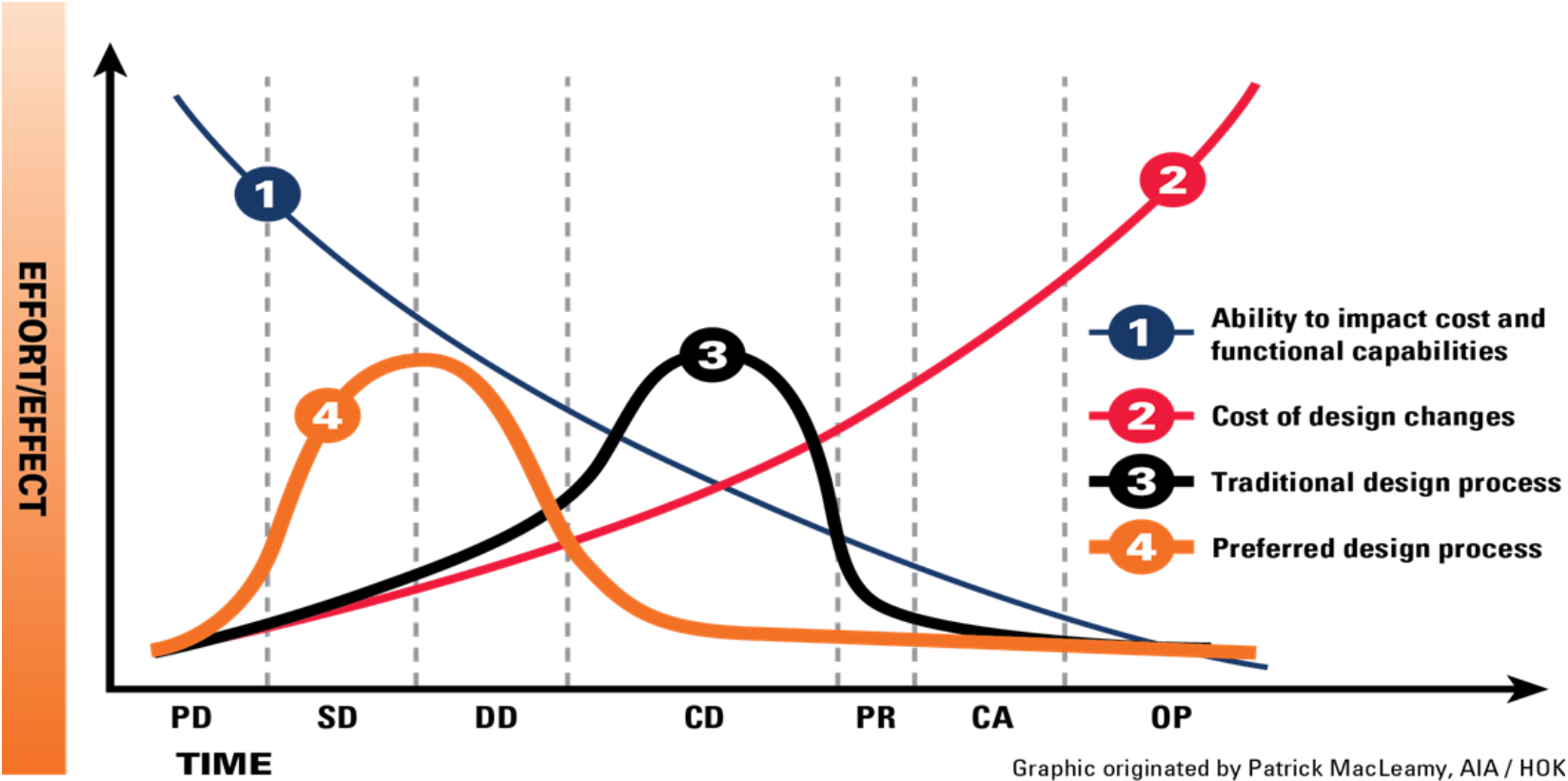
# Synergistic Examples



- Lean and BIM
- Sustainable Design and BIM
- BIM and IPD



# AEC Industry Transformation

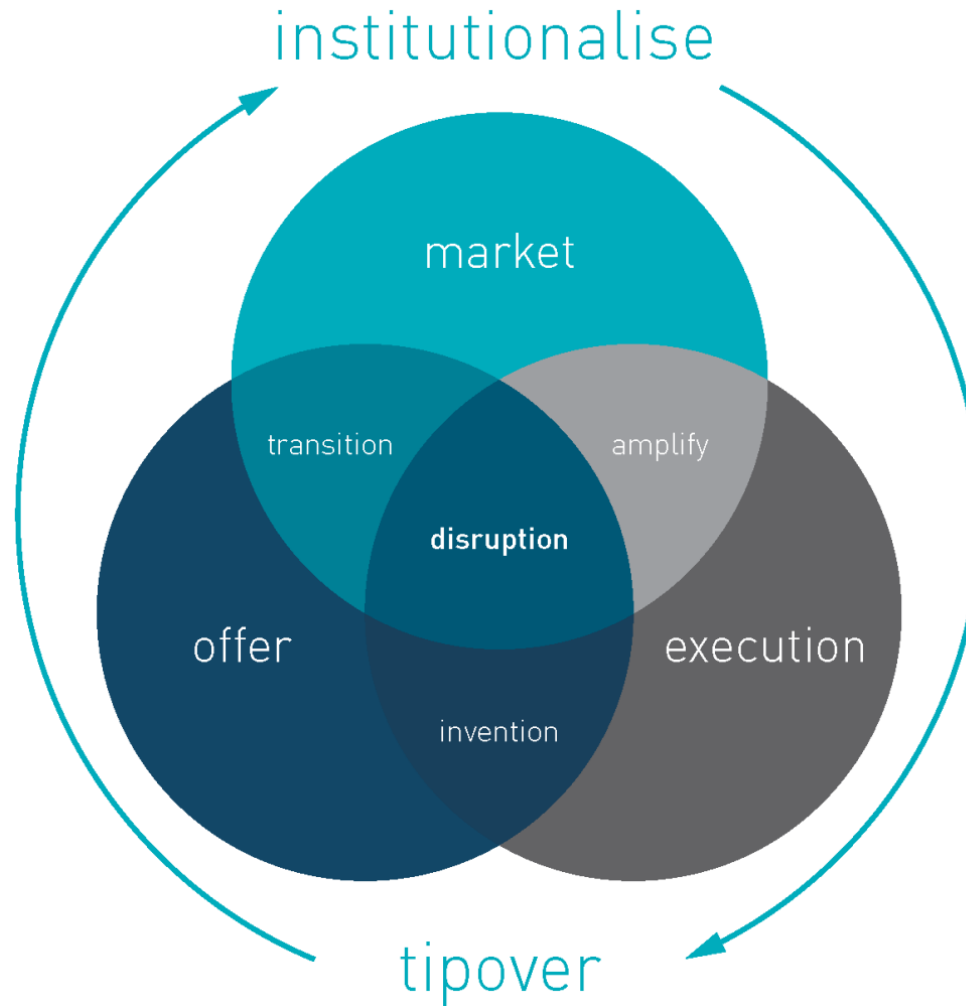


**KEY**

<b>PD:</b> Pre-design	<b>CD:</b> Construction documentation	<b>CA:</b> Construction Administration
<b>SD:</b> Schematic design	<b>PR:</b> Procurement	<b>OP:</b> Operation

- New ideas and processes
- New products
- New Services

# Coping with AEC industry disruption and transformation



- Leadership
- Strategy
- Getting to the Future
- Organizational Structure
- The Human Element and change
- Become a High Velocity Organization
- Look For Blue Ocean Opportunities

# Leadership

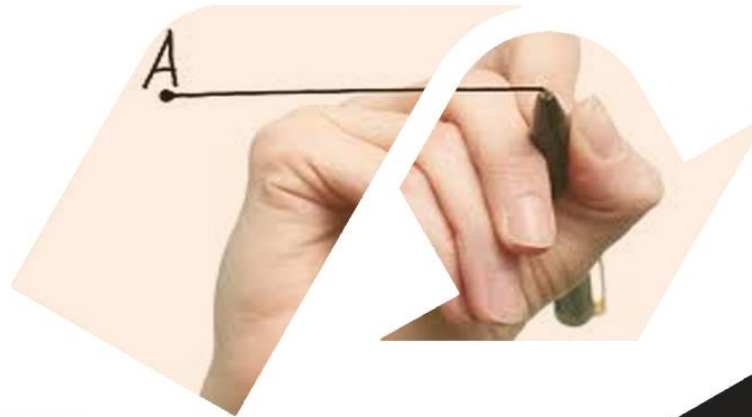


- Executive buy-in
- Communication
- Solid leadership while navigate an organization through time of disruption and transformation

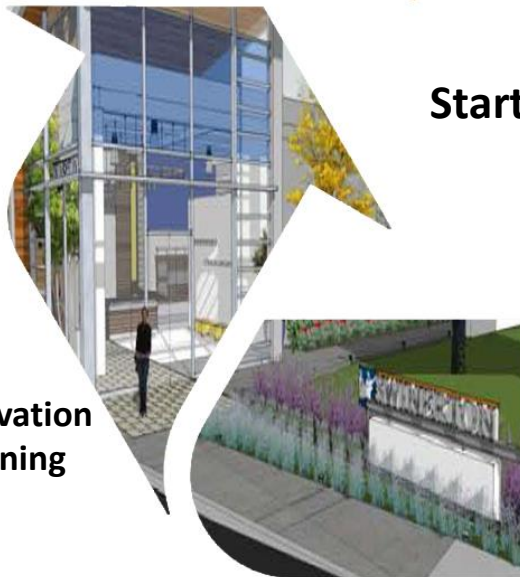


# Strategy and Plan

Planning



Starting Points



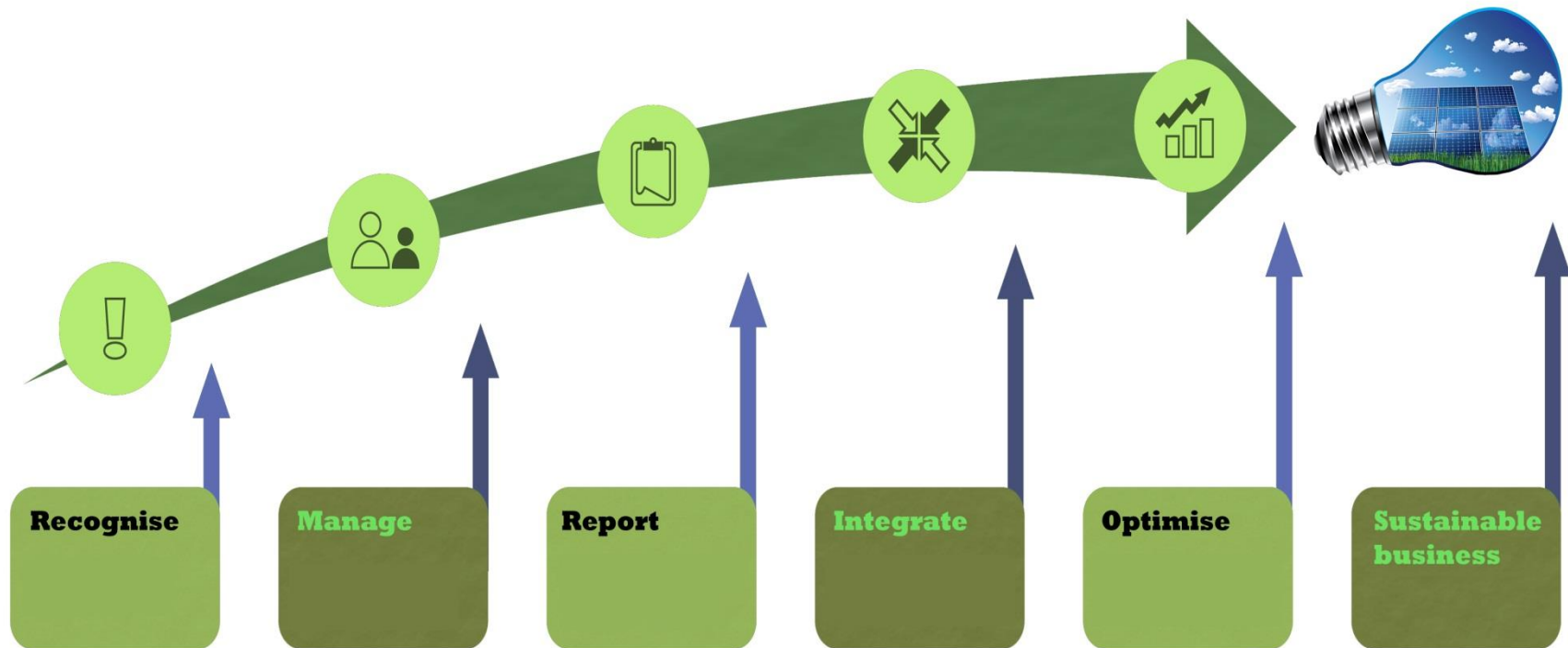
**Vision & Innovation  
at the beginning**

**Business  
Drivers**



- Gap Analysis
- Long Term Vision
- Strategic Plan
- Short-term victories
- Be ready to change your plan

# Be a Nimble Organization because “shift” happens



- Organizational structure-be an octopus not a pyramid
- Best information comes from those closest to the client
- Use Big Data to spot trends before your competitors
- Practice the “thirty under thirty” rule

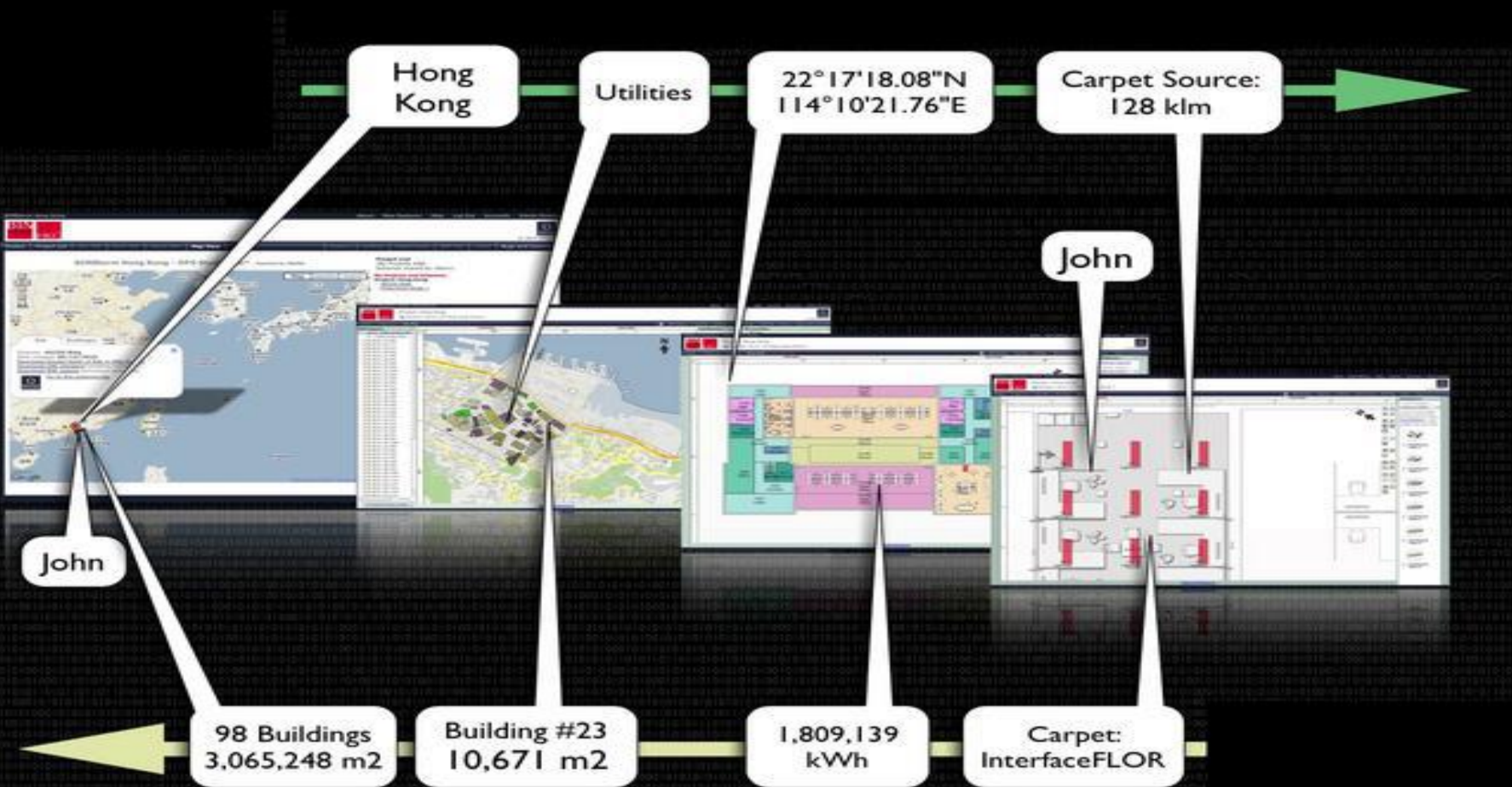
# The Human Element and Change



- Human's naturally resist change
- Changing the culture
- Focus on your innovators



# Become a High Velocity Organization

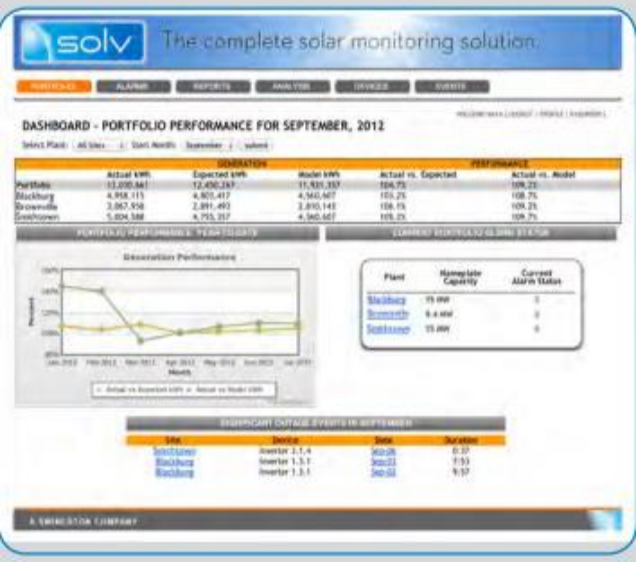


- Culture of collaboration
- Knowledge management (internal and external)
- Business knowledge from data

# Look for Blue Ocean Strategies

## SOLV Architecture

- Live Monitoring of Solar Sites
- Asset Management
- Secure Robust Architecture
- Visual Display of Complex Info
- Role Based Dashboards
- Operations and Alert Management
- Intelligent Reporting



- Example: Swinerton Renewable Energy Division
  - New Markets, Services, Clients & Geos.
  - New Revenue Sources & Types
  - Increased Fees
  - Market dominance & expertise (no. 1 Solar Builder)

# Who Will Lead Us?- The rise of the Integrated Project Leader



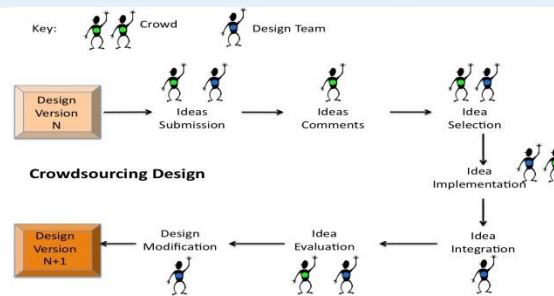
- Traits of an IPL
  - Global perspective
  - Recognized as unique in the industry
  - Middle brained
  - High Emotional Intelligence
  - Exquisite communicator
  - Systems and integrated thinker



# Are We Headed Toward “Future Shock”?

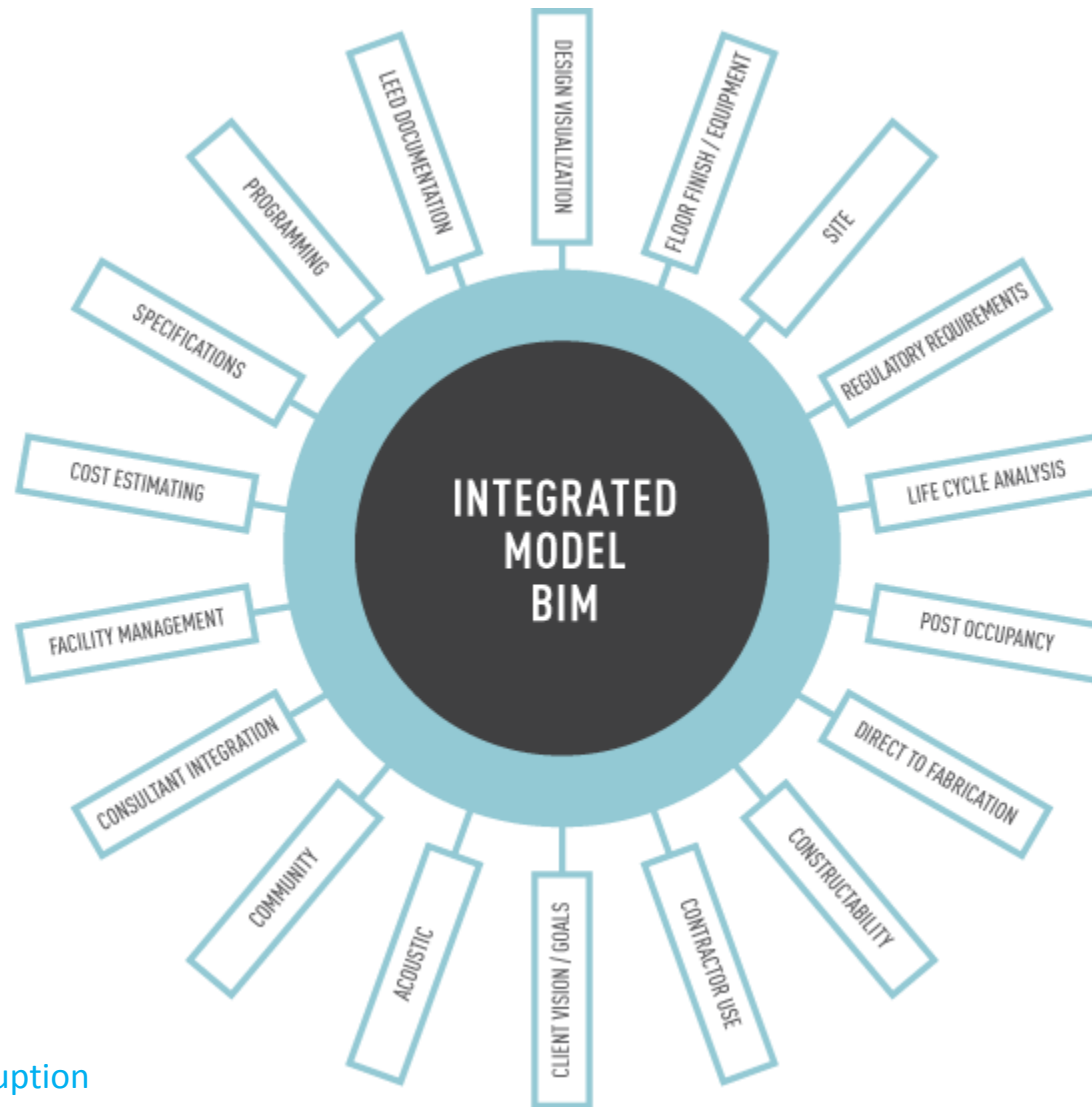


- Cloud computing
- Crowdsourcing
- Reality capture
- Open platform/maker movement
- Digital prefabrication (3D/4D printing)





# Summary and Conclusion



- Continuous disruption
- Increased convergence
- Global and non-traditional competition
- Cloud/mobile computing
- Social Media
- Customer experience

Thank you



26

[mckenzjr@gmail.com](mailto:mckenzjr@gmail.com)  
[www.AECVerge.com](http://www.AECVerge.com)

