

BIM & The Bottom Line: **Transcending the Hype Curve**



Nathan Wood | San Francisco, CA | October 1, 2015

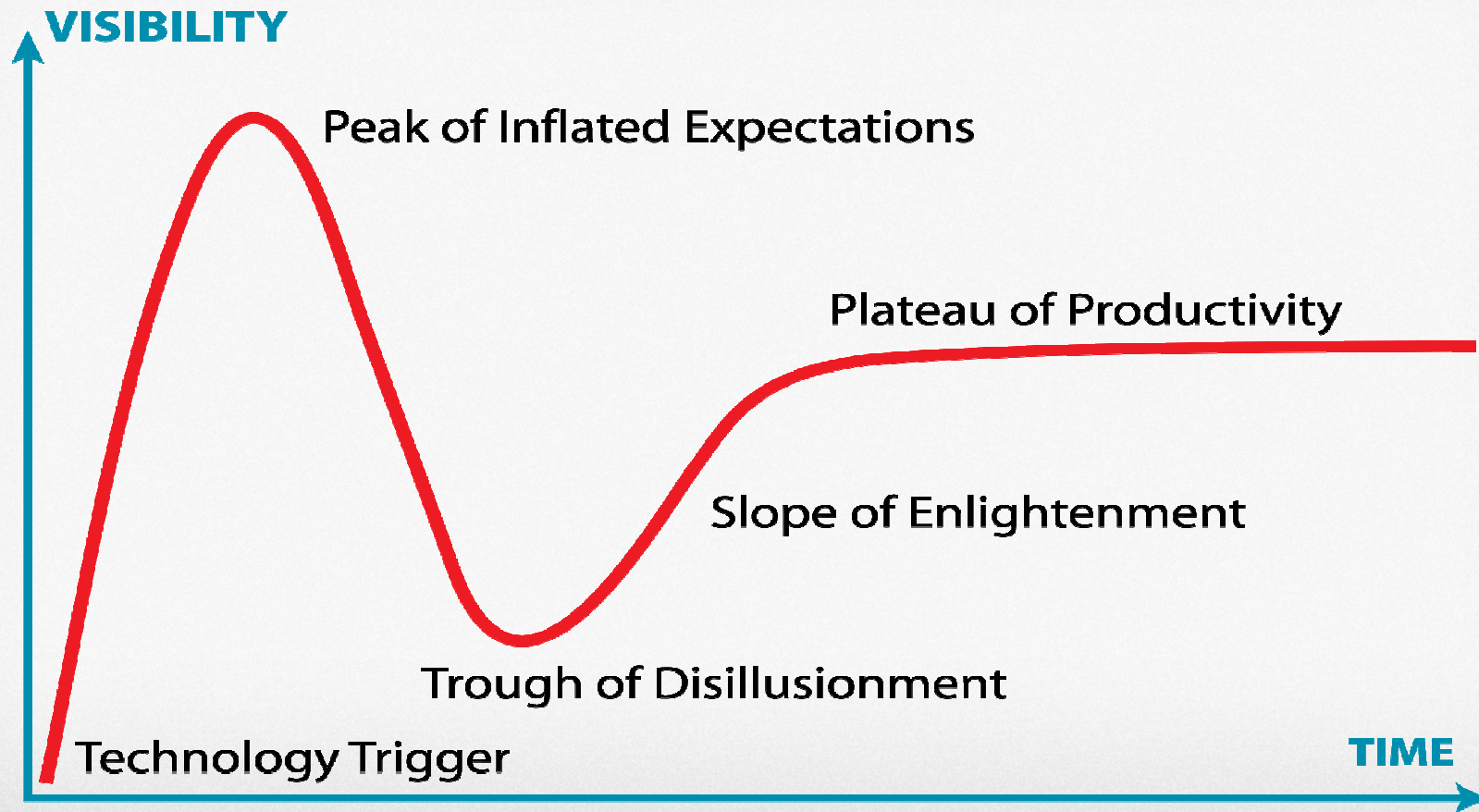




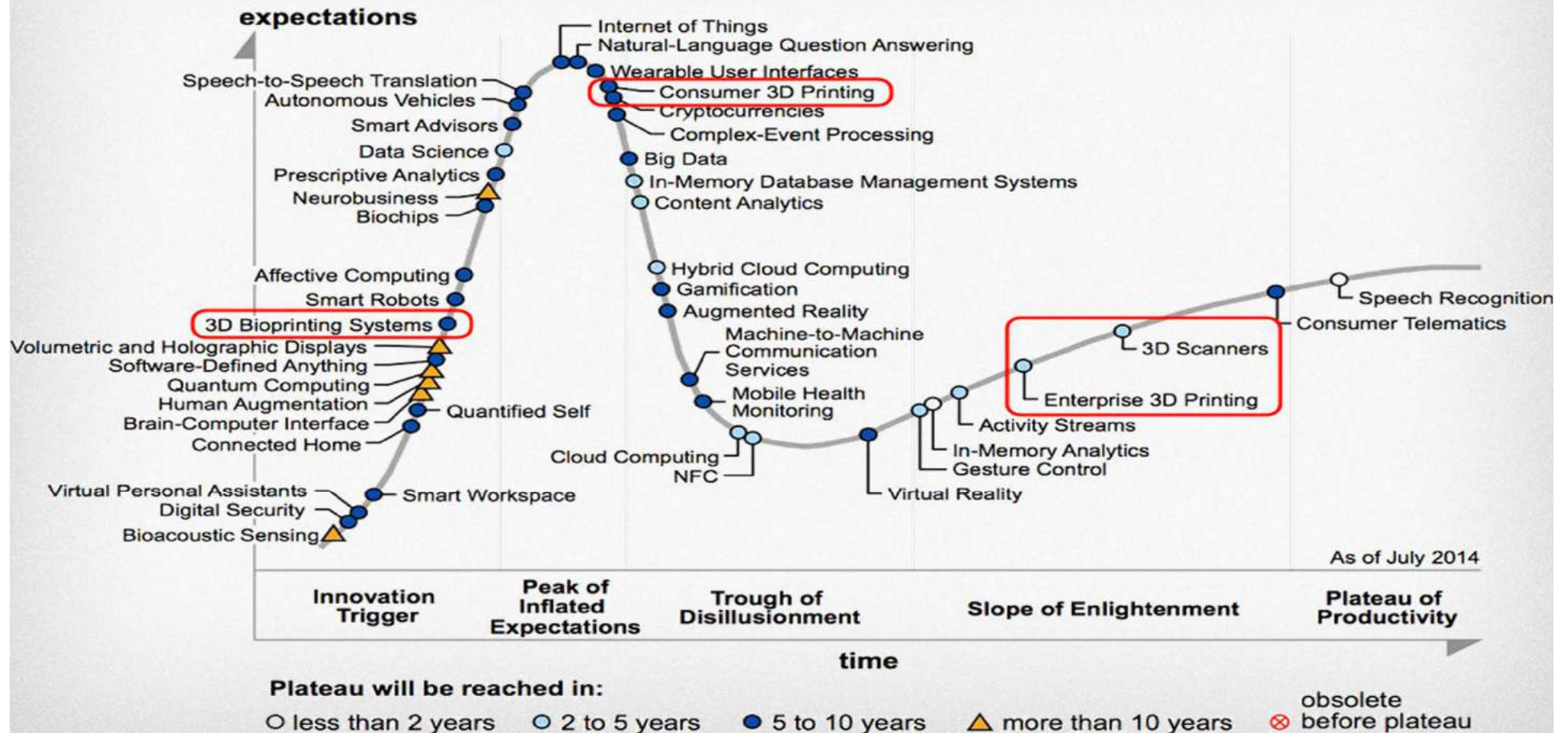
HYPE?

PRECISION AUTOLANDING

THE GARTNER HYPE CYCLE



MARKET EXPECTATIONS – FALL '14



HAS DPR TRANSCENDED THE HYPE?

I'll leave that up to you...

● The Story of

- A Brief History
- Our BIM Journey
- Where We Are Today
- Where We Are Headed





July, 1990

Redwood City, CA



Ron Davidowski

Doug Woods

Peter Nosler

A COMPANY ON A MISSION

To Be One of the Most Admired Companies by 2030

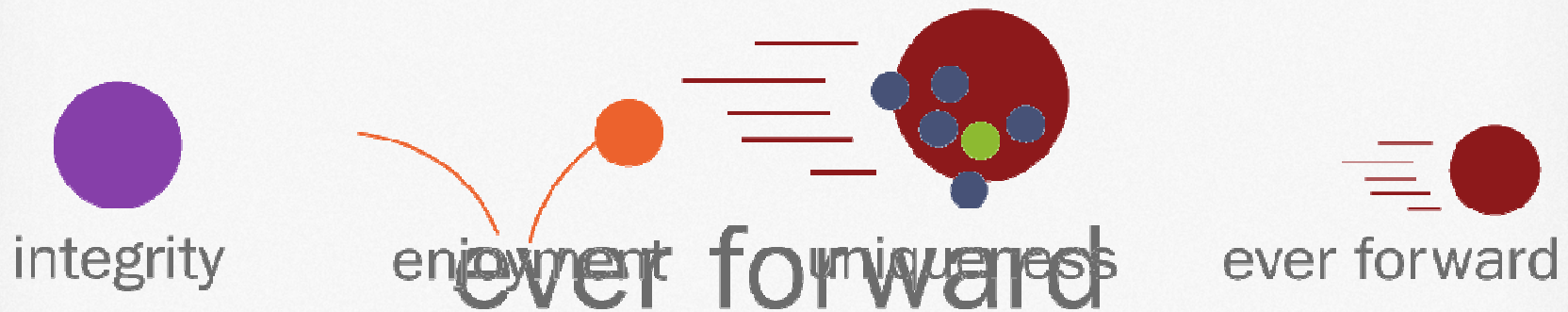
“To say we wanted to become a truly great construction company by the year 2000 was like a three-year-old saying, ‘I want to graduate from college by the time I’m 10.’ We do set high goals, but with the people we have in place, we know we can reach every one of them.”

- Doug Woods

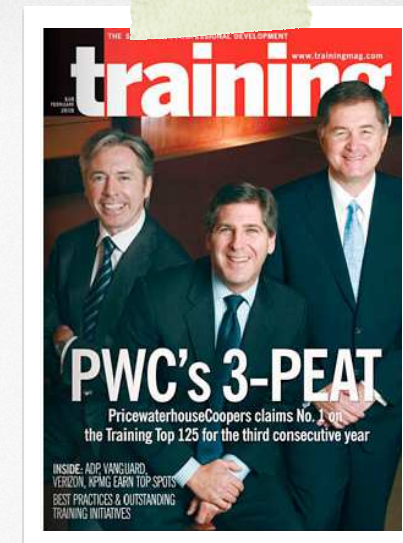


CULTURE IS AT THE CORE

DPR's Four Core Values



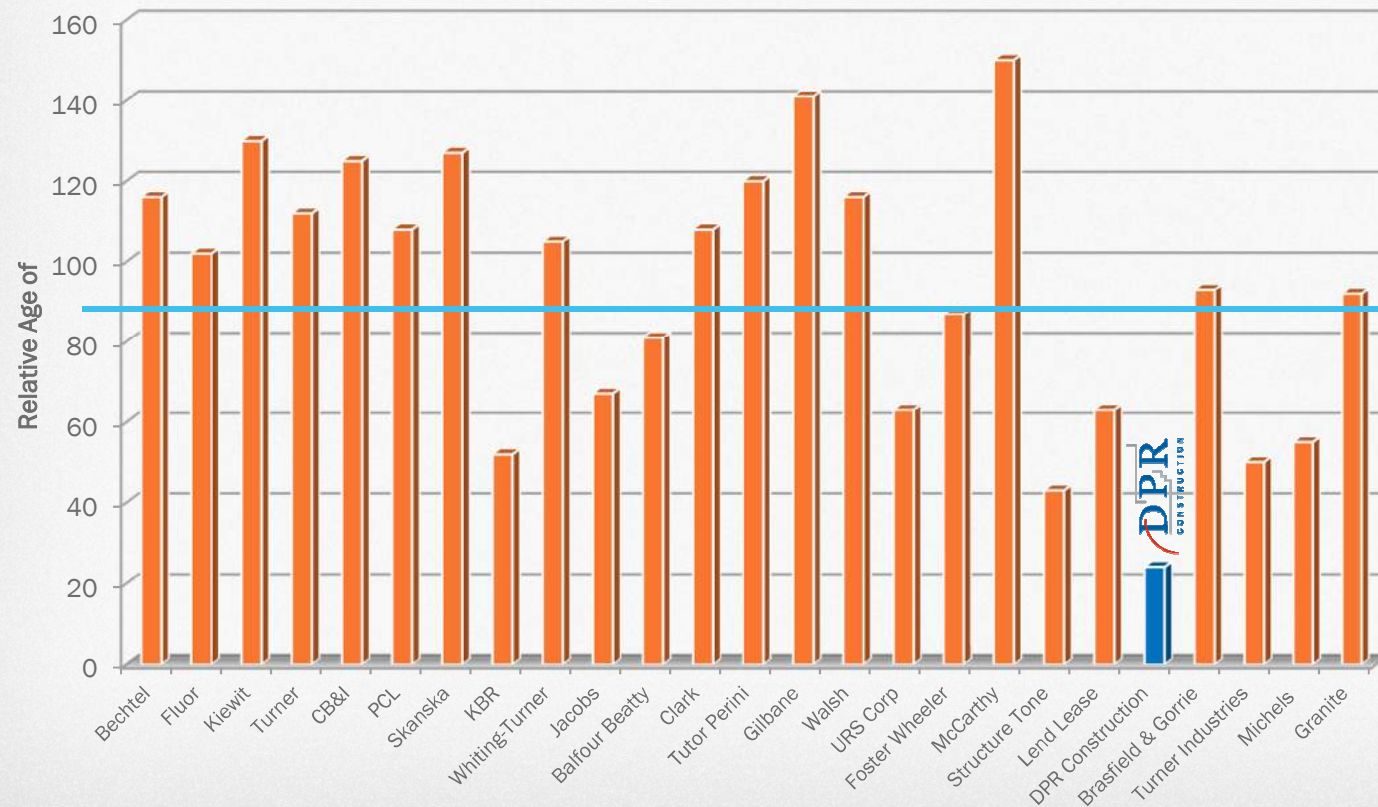
“We believe in continual self-initiated change, improvement, learning and the advancement of standards for their own sake.”



FORTUNE magazine ranked DPR No. 10 on the list of The 100 Best Companies to Work For: 2014.

TOP 25 IN UNDER 25?!?

DPR is Youngest US Contractor, ENR top 25



Average
~93
Years Old

DPR VOLUME OVER THE YEARS

The Impact of the '.com' Era



ADVANCED
TECHNOLOGY



CORPORATE
OFFICE



HIGHER
EDUCATION



LIFE
SCIENCES



HEALTHCARE



DPR OFFICES – NATIONAL FOOTPRINT

20

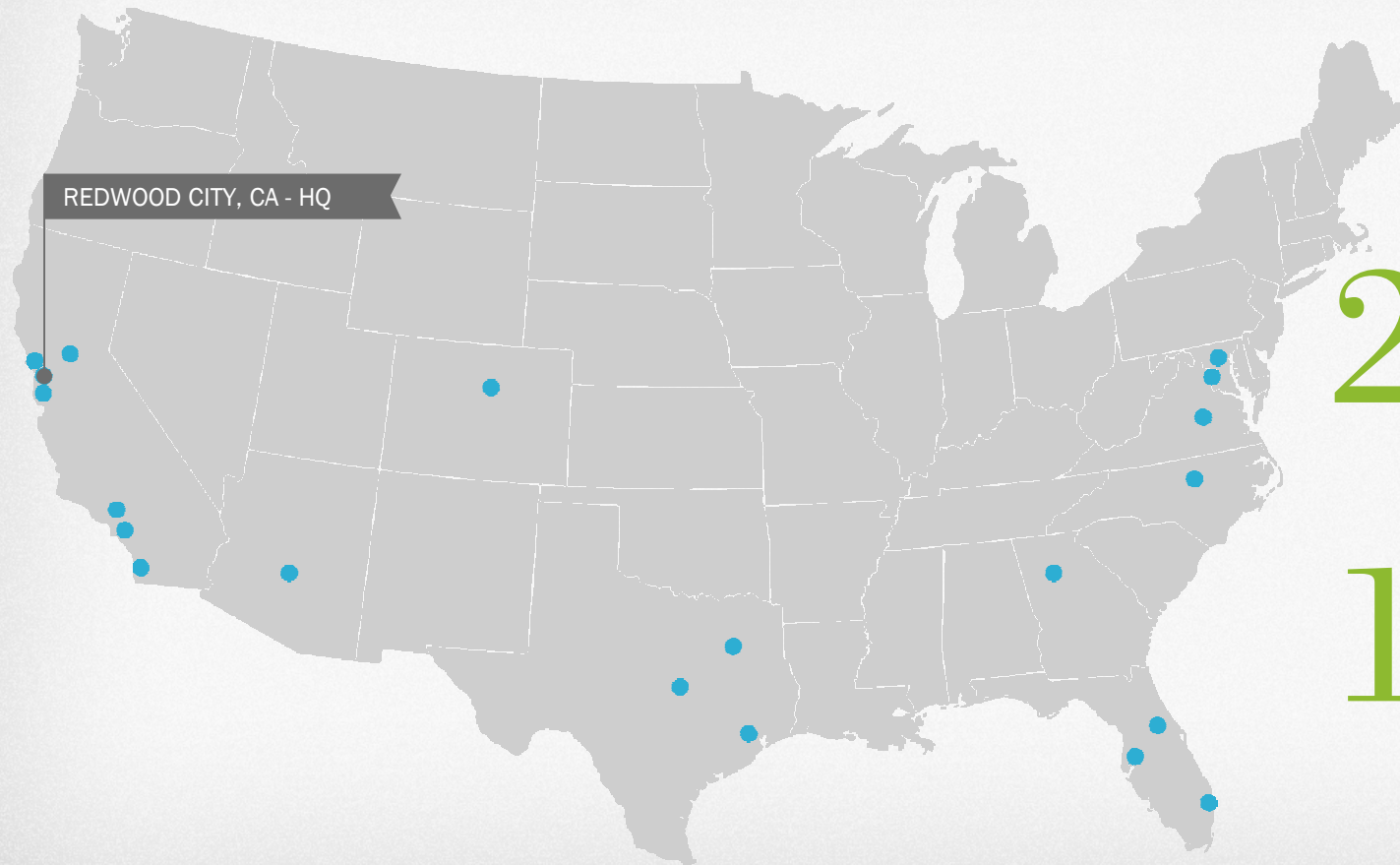
LOCATIONS

2,600

FULL-TIME STAFF

1,400

CRAFT EMPLOYEES



DPR OFFICES – INTERNATIONAL FOOTPRINT

A light gray world map serves as the background. Red dots indicate office locations in North America (USA and Mexico), South America (Brazil), the Middle East, India, Southeast Asia (Indonesia), and Japan. Blue dots indicate office locations in Europe (UK, Germany, Sweden) and China.

22

LOCATIONS
WORLDWIDE

2,600

FULL-TIME STAFF

1,400

CRAFT EMPLOYEES

THE DPR BIM JOURNEY

A Look Back....

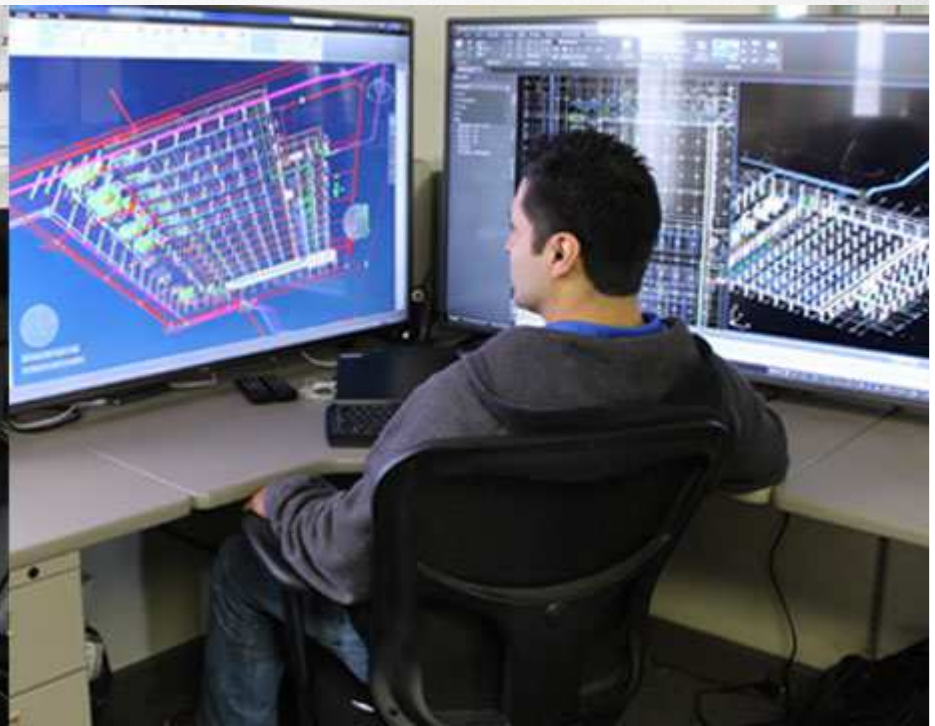


25 YEARS ON THE EDGE

Influenced by the 'Silicon Valley'

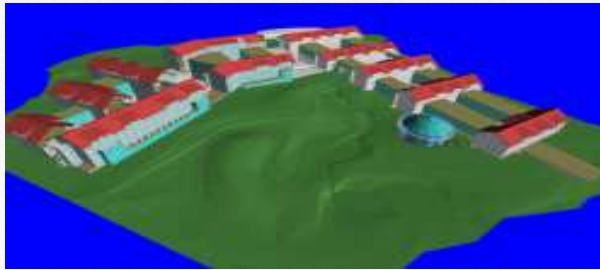


1990

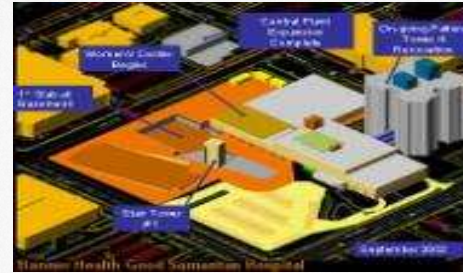


2015

1998-2006: EARLY BIM PILOT TESTS



Letterman (Proposal)



Banner Good Samaritan
(Logistics)

1998

DPR Portland Office
(Pilot)

2001

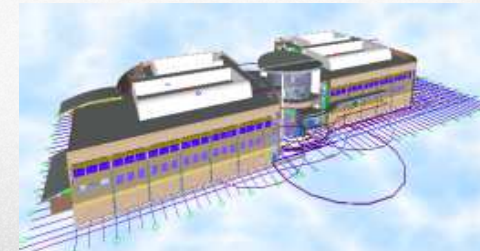
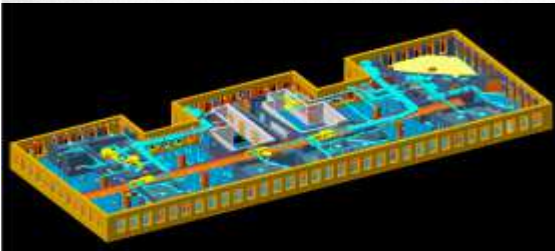
2002

Bay Street Emeryville
(Construction)

2003

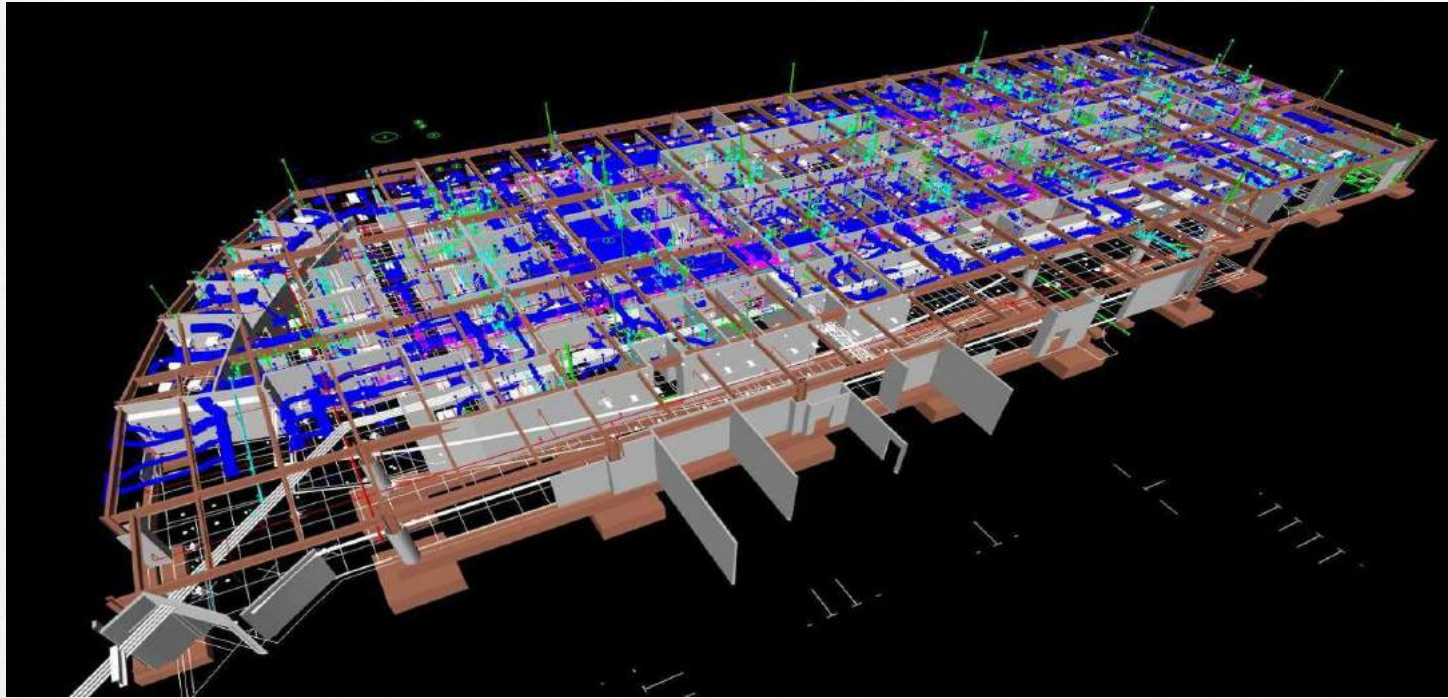
Camino Medical Center
(Construction)

2006



EVERYTHING CHANGED IN 2006

Saved \$9M and 6 months on \$100M Medical Project



Camino Medical Office Building Project – Fully modeled with amazing results

2007: FIRST DPR BIM SUMMIT

Still the same message...



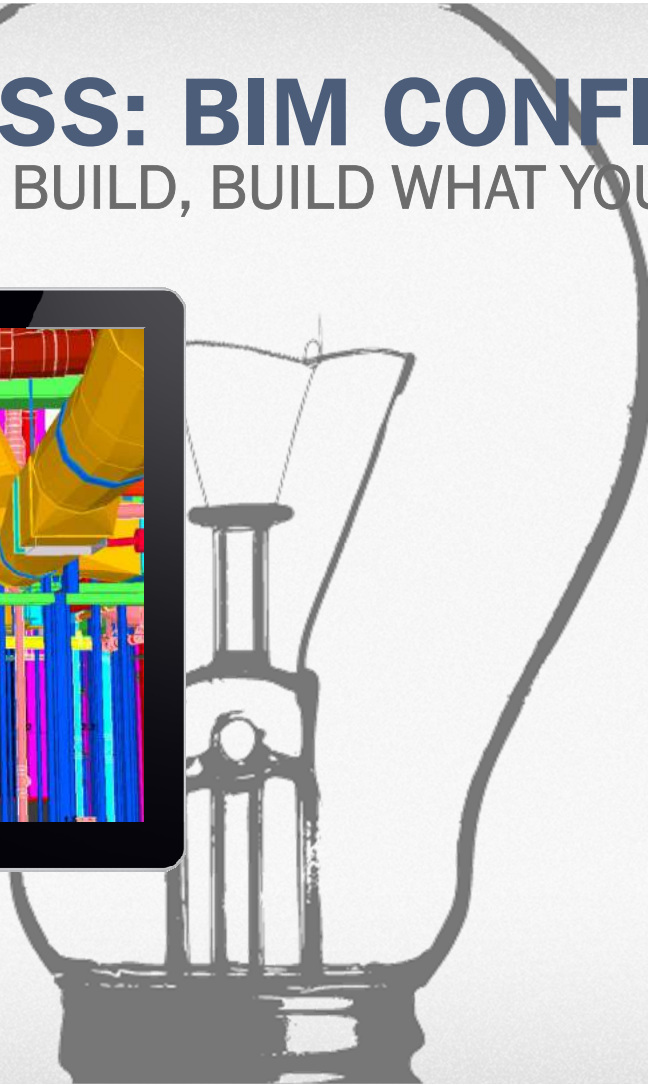
2007: A NEW DEFINITION OF BIM

“A digital representation of physical and functional characteristics of a facility. A BIM is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition.”

National BIM Standard v1, 2007

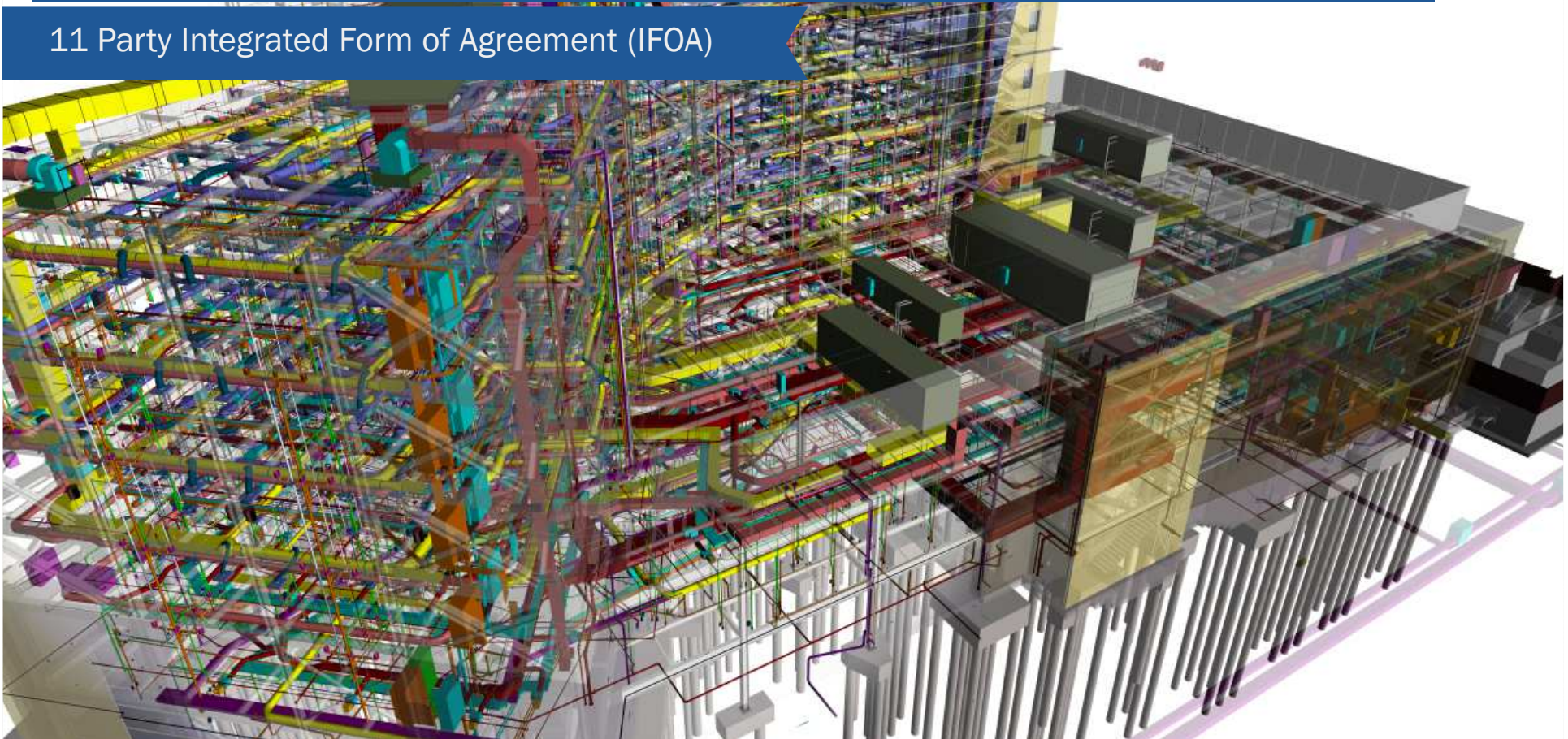
KEY TO SUCCESS: BIM CONFIDENCE

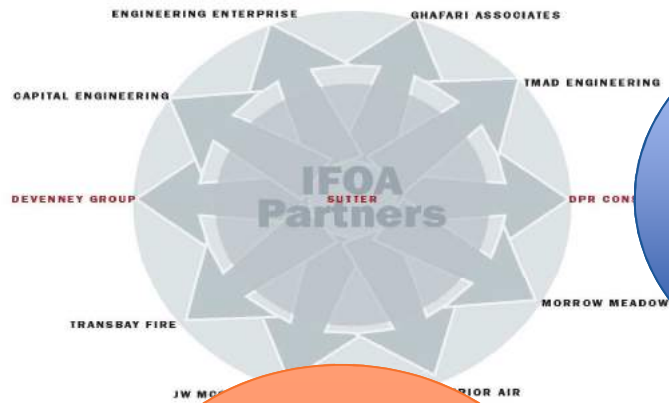
MODEL WHAT YOU WILL BUILD, BUILD WHAT YOU WILL MODEL



2007-12: SUTTER MEDICAL CENTER CASTRO VALLEY

11 Party Integrated Form of Agreement (IFOA)





As-Built
Model

30%
Reduction in
Schedule

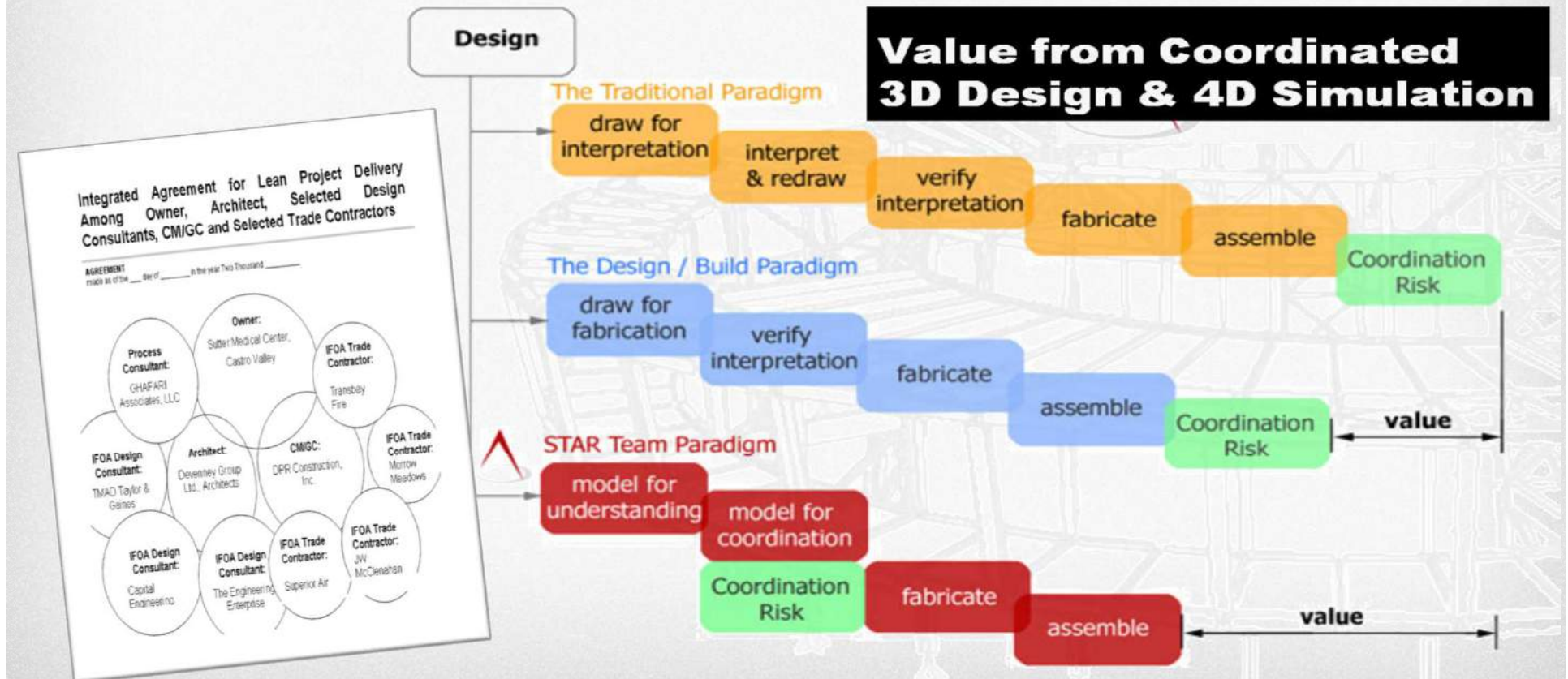
No
Rework
(MEP)

Increase
Field Crew
Production



INTEGRATED PROJECT DELIVERY (IPD)

Eliminate Wasted Processes with Shared Incentives



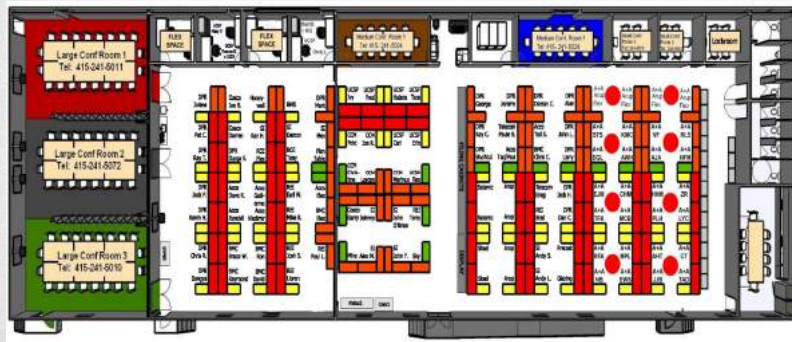
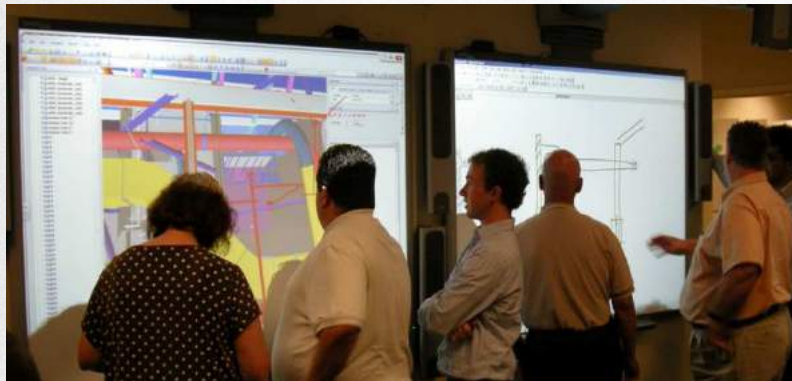
WE CAN'T FIX THE SYSTEM WITHOUT...

Directly Impacted by Contract Type



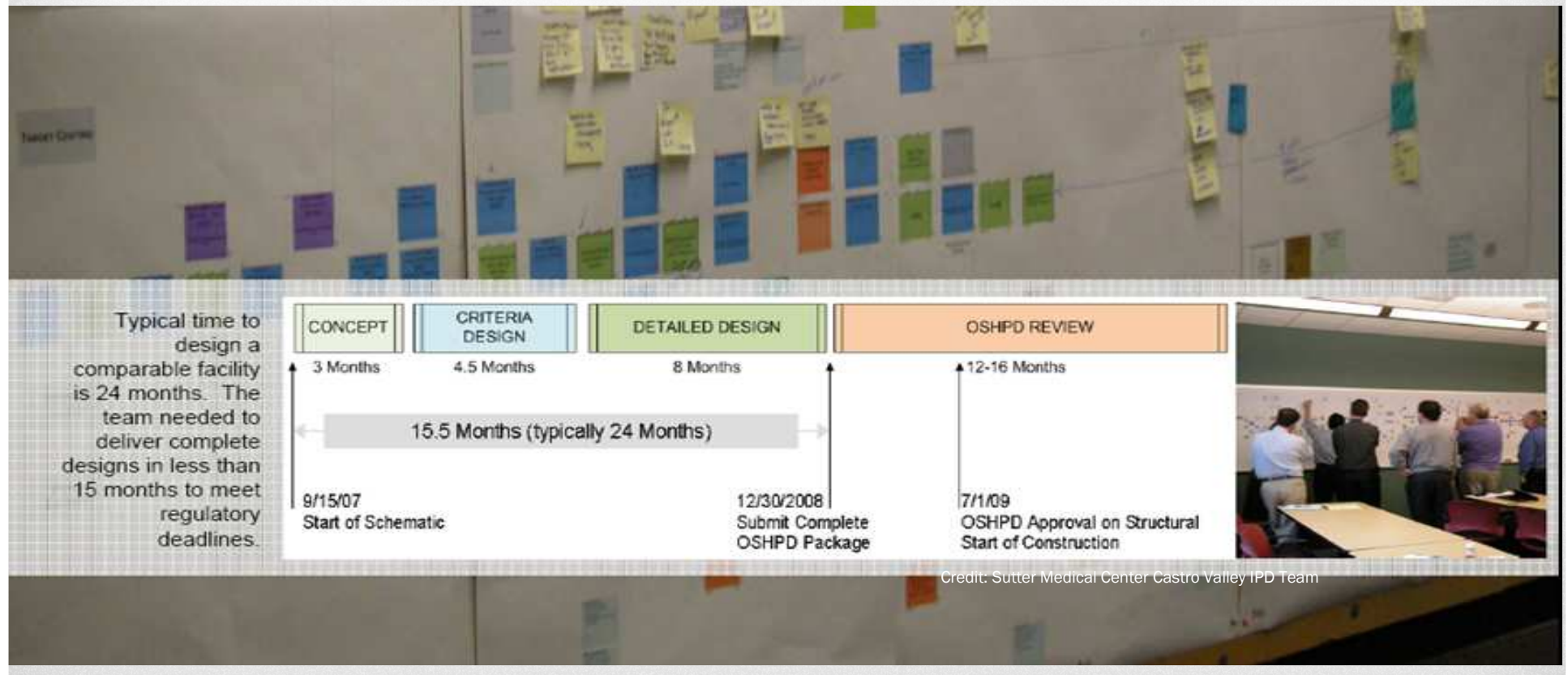
TRUST: CREATED IN THE 'BIGROOM'

Onsite office for all parties to communicate



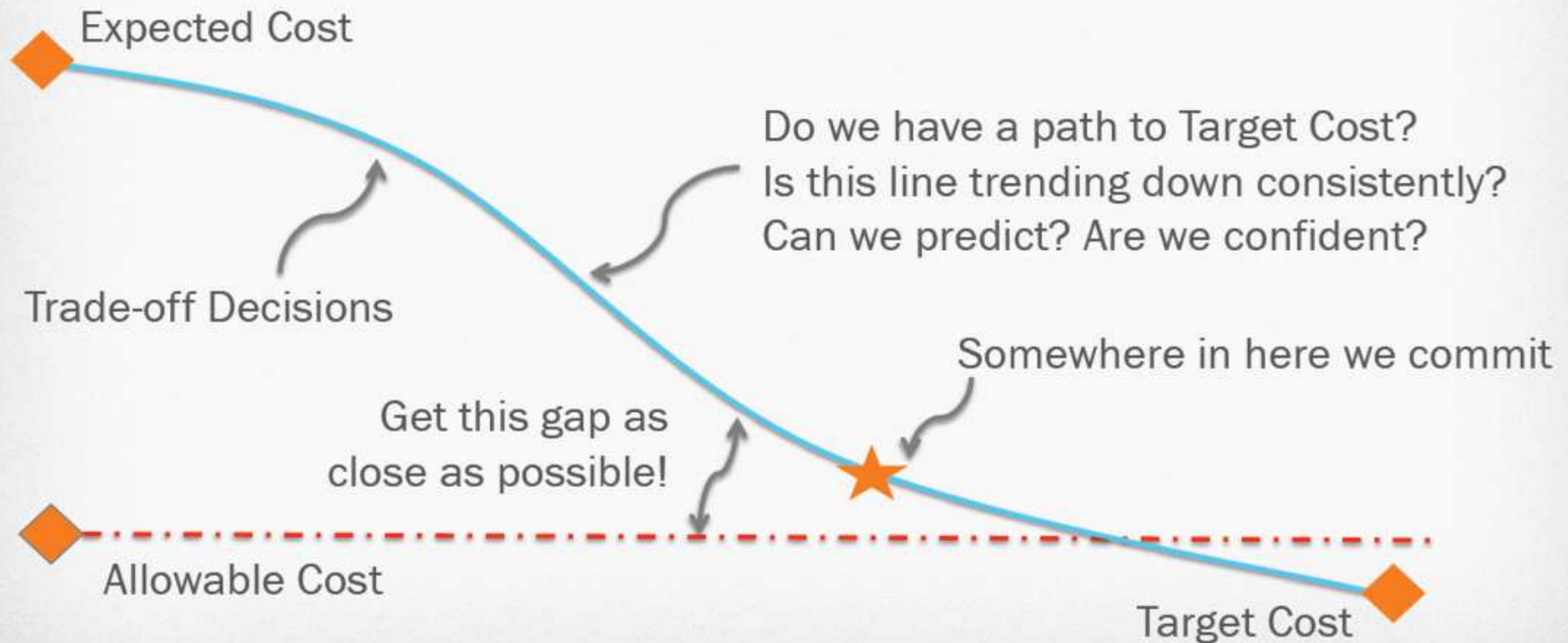
TRUST: COMMITMENT TRACKING

Key Factor to Reduce Design Schedule



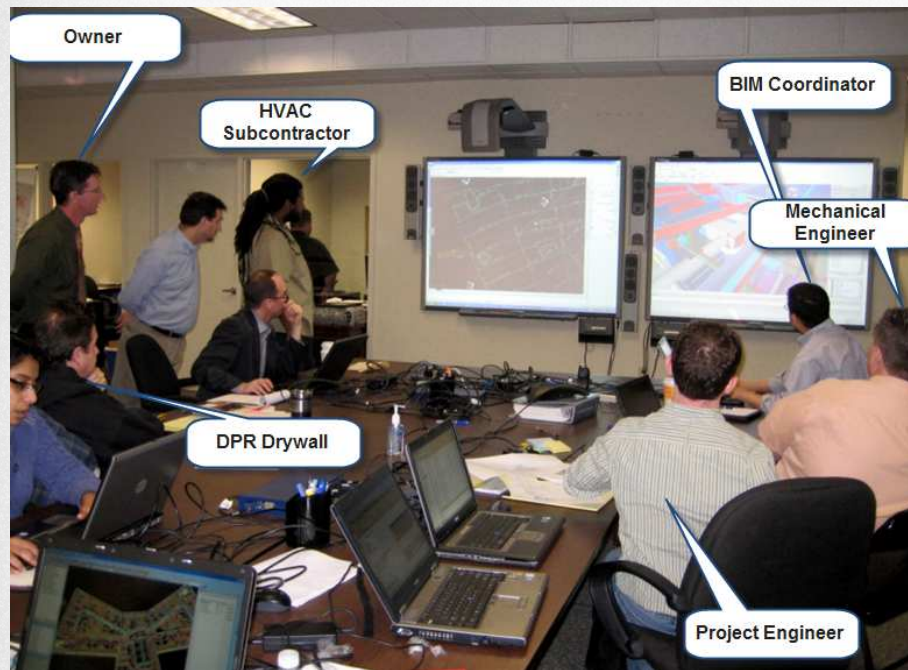
TRUST: TARGET VALUE DESIGN (TVD)

TVD Succeeds when there is Trust and Transparency



TRUST: CONSTRUCTABILITY INPUT

Address Issues Earlier & Identify Opportunities



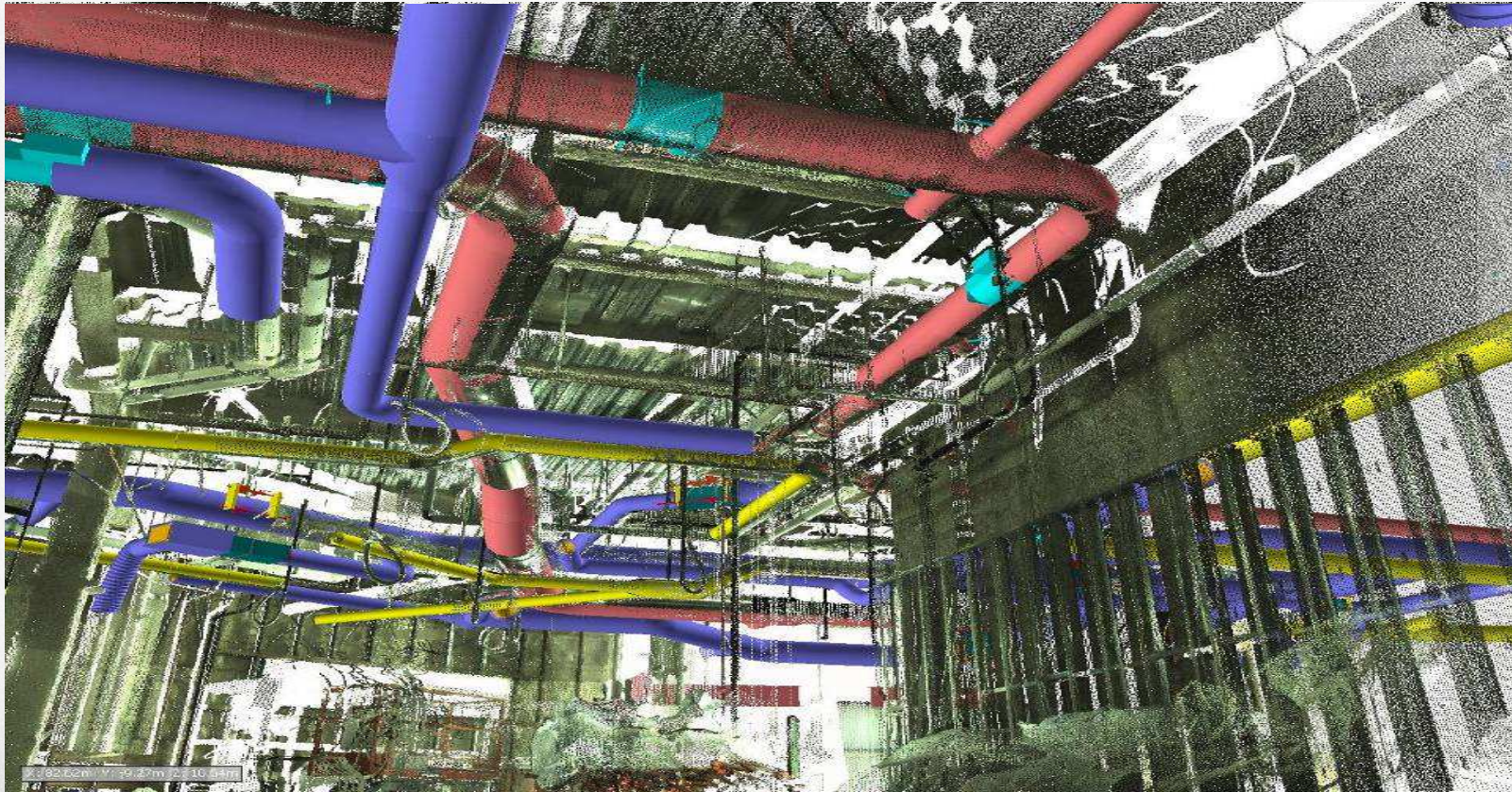
TRUST: TRADES INSTALL FROM BIM

Utilize BIM from Design to Fabrication to Installation



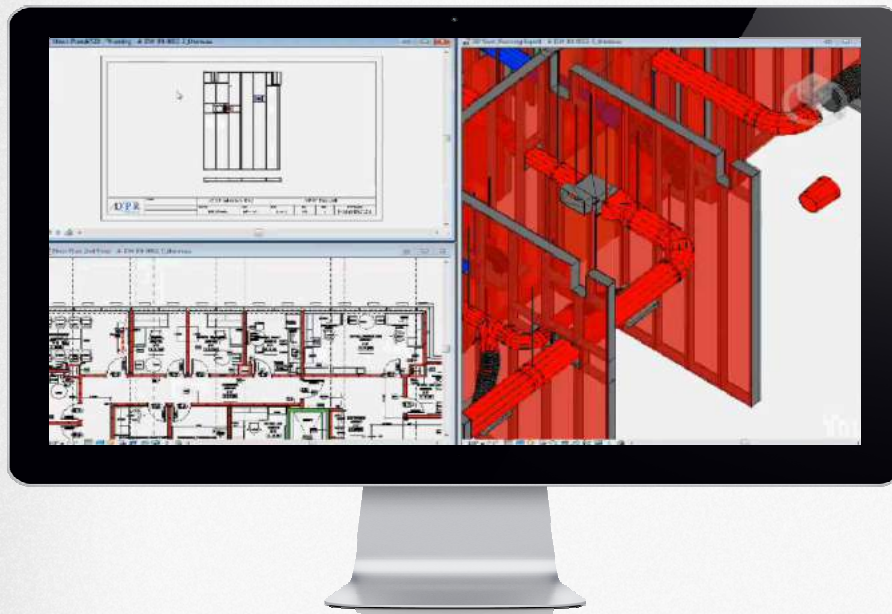
TRUST: RECONFIRM BIM = REALITY

Critical Value to Downstream BIM Use



TRUST: IMPROVED FRAMING PROCESS

Using BIM Confidence to Increase Productivity & Quality



Drywall Spool Sheets Direct from
Coordinated BIM



RESULTS: SCOPE INSTALLED PER BIM

Sutter Medical Center Castro Valley

Scope	Percentage
Mechanical	98%
Plumbing	98%
Electrical	71%
Framing	79%

Project: Sutter Eden Health Medical Center, Castro Valley, CA

RESULTS: REWORK REDUCTION

Sutter Medical Center Castro Valley

Scope	Baseline	Actual	
Mechanical	10%	<0.5%	95%
Plumbing	10%	<1%	90%
Electrical	10%	5%	50%
Framing	5%	0.5%	90%

Project: Sutter Eden Health Medical Center, Castro Valley, CA

RESULTS: INCREASED PRODUCTIVITY

Sutter Medical Center Castro Valley

Scope	Baseline	Planned	Final
Mechanical	100%	105%	120%
Plumbing	100%	100%	106%
Electrical	100%	114%	104%
Framing	100%	122%	128%

Project: Sutter Eden Health Medical Center, Castro Valley, CA

2010-15: UCSF Mission Bay

Guaranteed Maximum Price Contract with Shared Saving



SYNERGY: BIM + TOTAL STATION

Using Robotic Total Station Integration



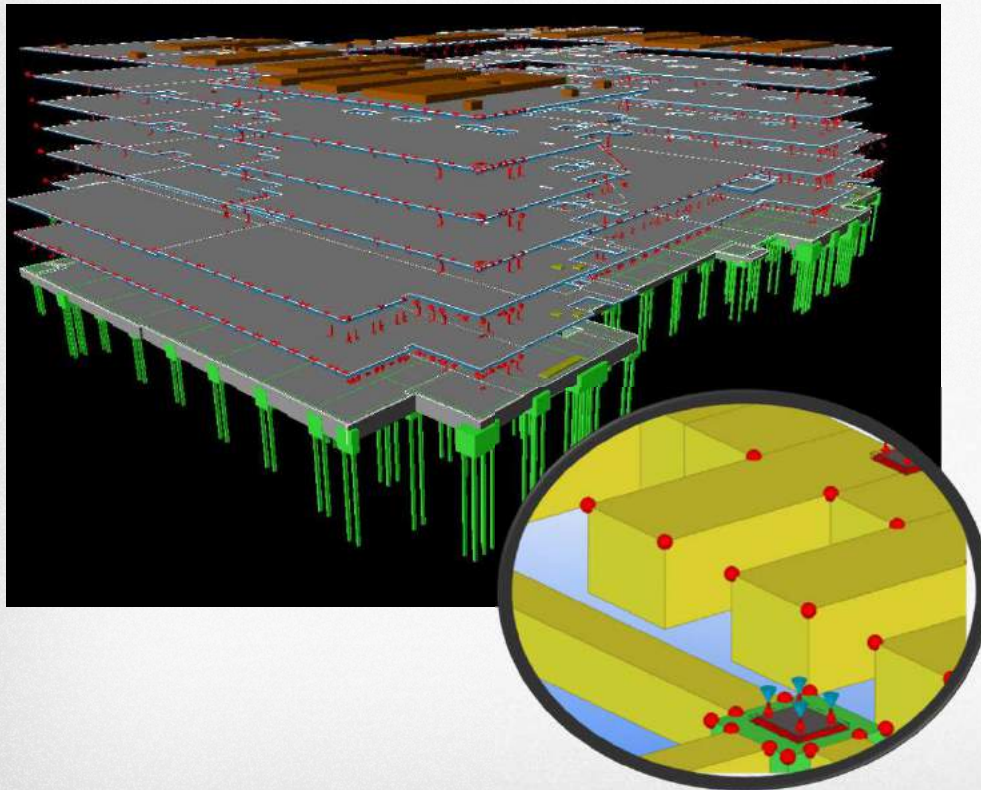
4X PRODUCTIVITY INCREASE

HAND LAYOUT FROM 2D: 75 INSERTS/DAY

BIM + TOTAL STATION: 300 INSERTS/DAY

DIRECT BIM VALUE: ACCURACY

Concrete Foundation Pier Caps



- 2,500 Anchor Bolts
 - Set with BIM + Total Station
- 2,493 Installed Exact
 - 99.7% Accuracy
- Waste Forecast
 - Traditional - 15%
 - Total Station – 6%

2012-13: Temecula Valley Hospital

IPD Joint Venture with Turner Construction



DIRECT VALUE: OVERALL PRICE

Reducing Cost Per Patient Bed

- Average Construction Cost, CA
 - \$1.8 Million Per Patient Bed
- UHS Temecula Construction Cost
 - \$1.07 Million Per Patient Bed

40% Reduction in Cost

No Sacrifice in Schedule/Quality

Pushing the Limits of Productivity on New UHS Temecula Hospital Project

Completed early within one of the most aggressive budgets ever set for a hospital in the region and at 40 percent lower per bed than average, the project is a study in value.

The integrated project delivery (IPD) team for the new Temecula Valley Hospital has raised the bar when it comes to delivering bottom-line value to an owner on a major healthcare facility project.

Completed ahead of schedule in July 2013 for Universal Health Services (UHS), at an estimated 40 percent lower "per bed" cost than the average new Southern California hospital facility, the project was a study in productivity, efficiency, innovation and teamwork. An eight-member IPD team, led by joint venture contractor DPR/Turner Construction, shared both risk and reward for the facility's successful delivery.

The integrated team completed the project within one of the most aggressive budgets ever set for a hospital facility in Southern California.

Shared Risk and Reward

The ground-up, 35-acre greenfield UHS Temecula Valley Hospital campus project encompassed a 177,508-sq.-ft., five-story hospital tower. The 140-bed hospital features all private rooms, a 20-bed intensive care unit and six high-tech surgical suites.

As an IPD-structured project, the individual firms that were signatory to the integrated form of agreement (IFA) contract shared both project risk and reward through a common profit pool. Along with DPR and Turner, the other IPD members included HMC Architects; DPR Fleming and Drywall—which held the \$10 million drywall and framing contract; Bergelectric; Southland Southwest Fire; and owner Universal Health Services.



THE DPR BIM JOURNEY

Where are we today?





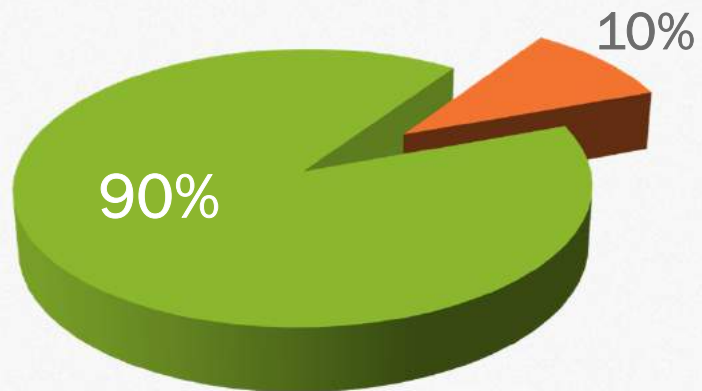
WE ARE ALL BUILDERS

VIRTUAL
^



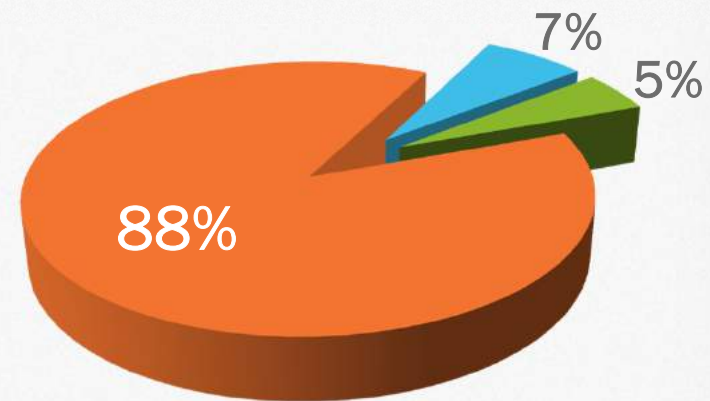
IMPLEMENTATION VS ADOPTION

Percent of BIM Projects at DPR
(By Volume)



- Projects with a BIM
- Non-BIM Projects

DPR Employee BIM Aptitude
(2012 Survey)

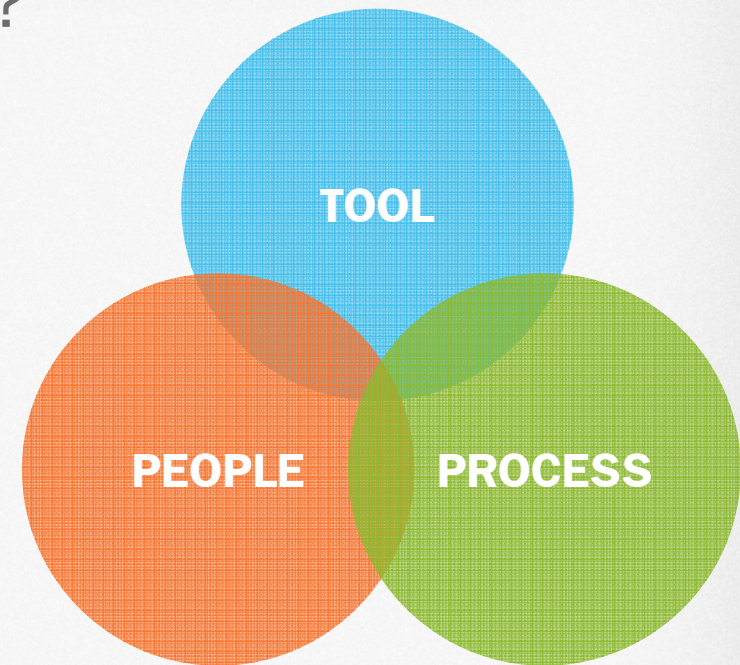


- Cannot Create or Utilize BIM
- Can Utilize BIM
- Can Create & Utilize BIM

SHIFTING THE INDUSTRY PARADIGM

How Should We Think About BIM?

- 1 BIM is just a Tool
- 2 This Tool is only as good as the People using It
- 3 The People can only be as effective as the Process allows them to be



EVERYONE HAS A ROLE IN BIM



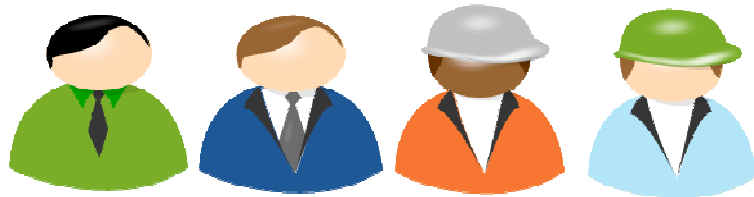
MODEL AUTHORS

Design Validation
Virtual Mock-Ups
Proposals
Construction Models
Model Management
As-Built Validation



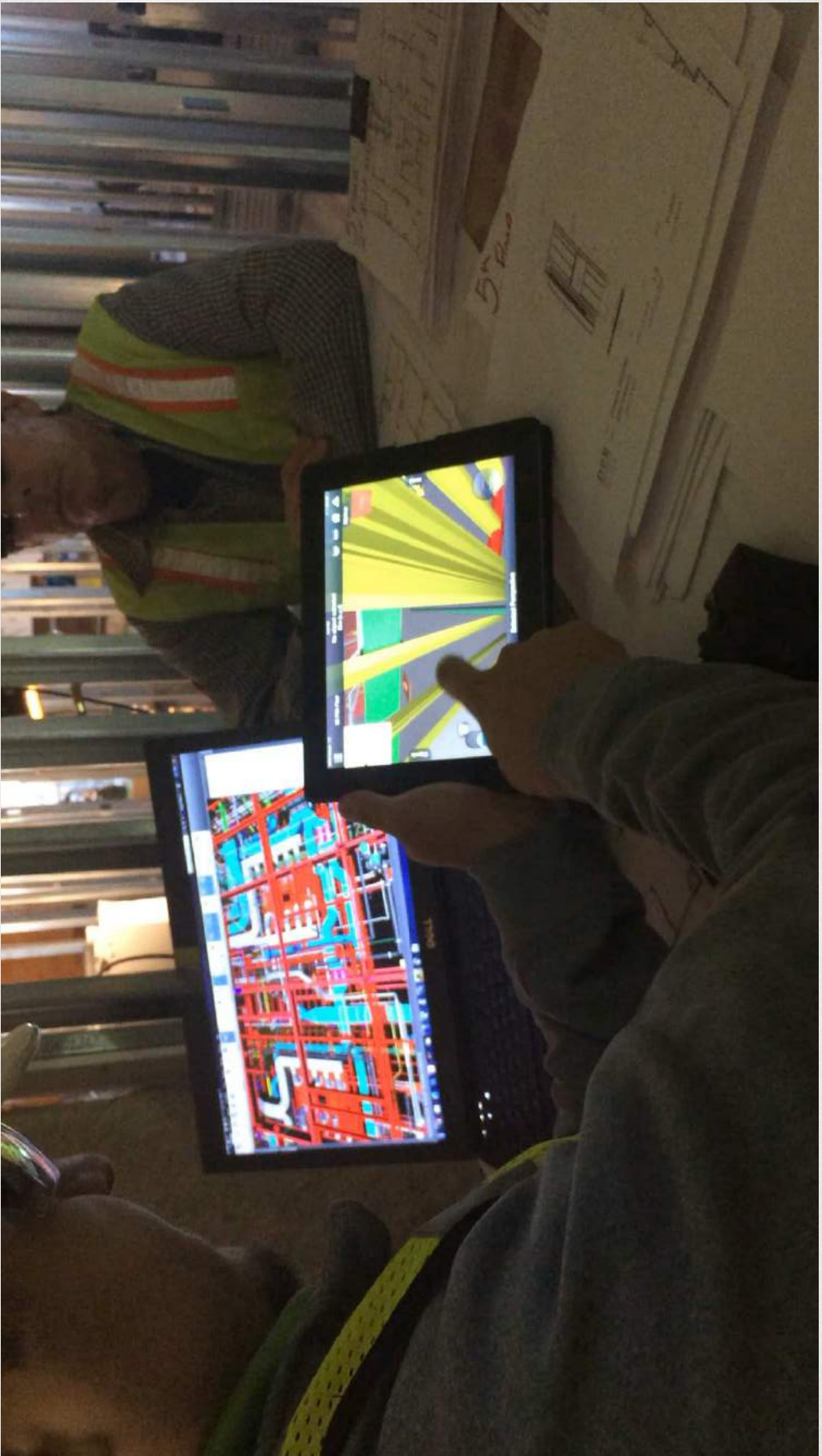
PROCESS MANAGERS

Coordination
Scheduling / 4D
Model Classification
Site Logistics
Model-Based Estimates
RFI's / Submittals /
Change Orders



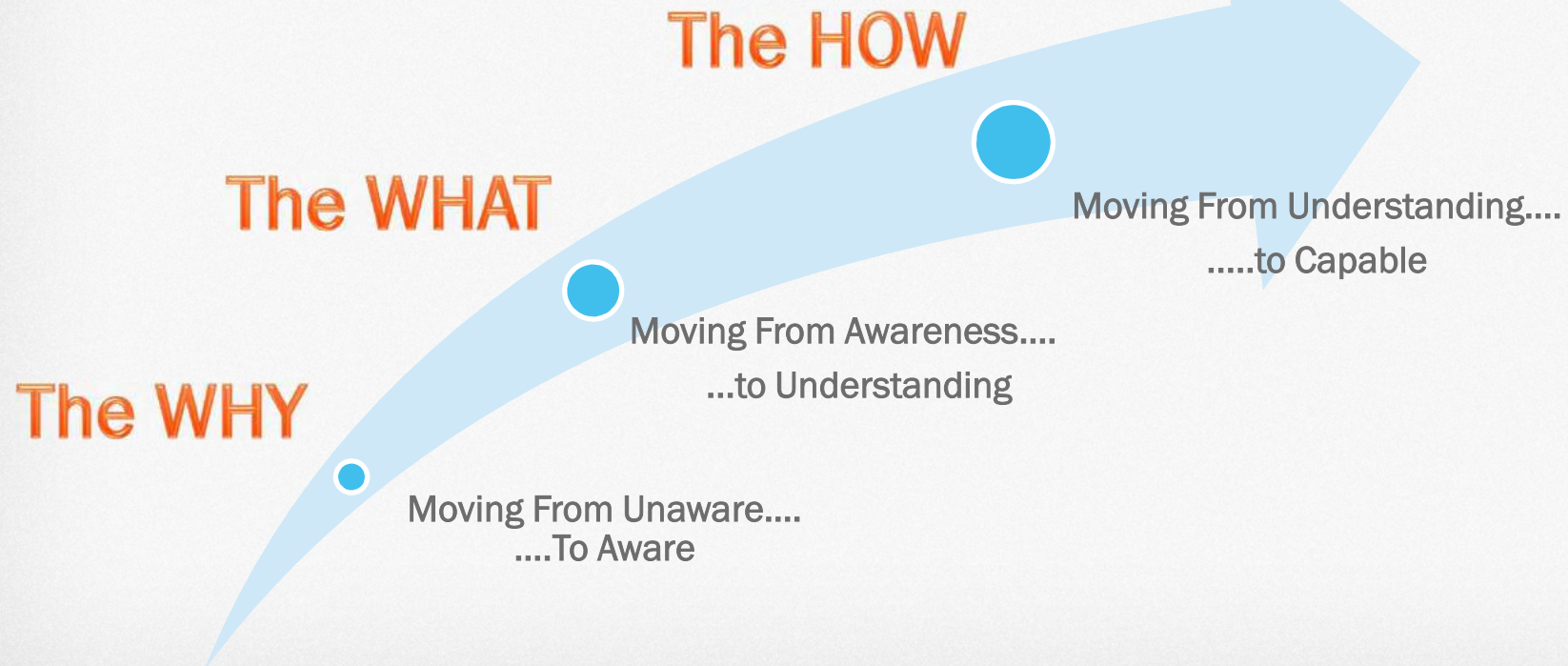
INFORMATION USERS

Model Navigation
Constructability Review
Comments / Approvals
Status Updates
Field Layout



STEPS TO CHANGING BEHAVIORS

It Doesn't Happen Overnight!



DON'T JUST PROMOTE IT, SUPPORT IT!

Invest the Necessary Time For Education & Training

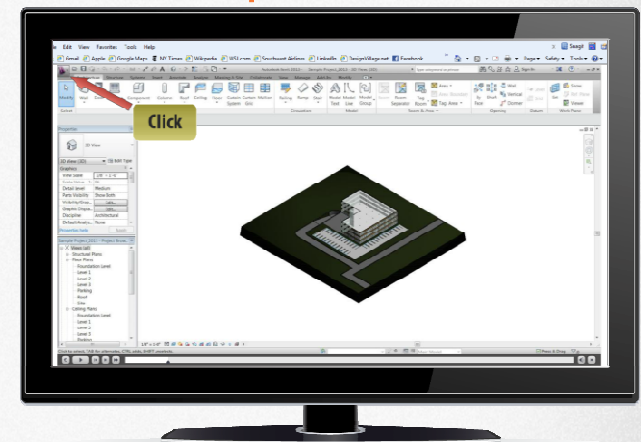
Classroom Education



Project Specific Training



Role Specific Tutorials



BIM ADOPTION IN THE U.S.

Still an Uphill Battle....

