

Bridging Academia and Industry

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School - Industry Partnerships

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The Big Idea

University - Industry collaboration has a compelling value proposition

Industry:

- Try and develop new methods inexpensively
- Identify emerging issues
- New hires
- Neutral place to interact with peers

Academia:

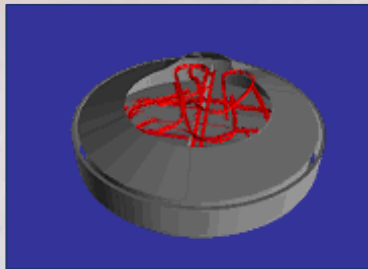
- Engineering & business problems
- “World laboratory” to validate new science
- Money

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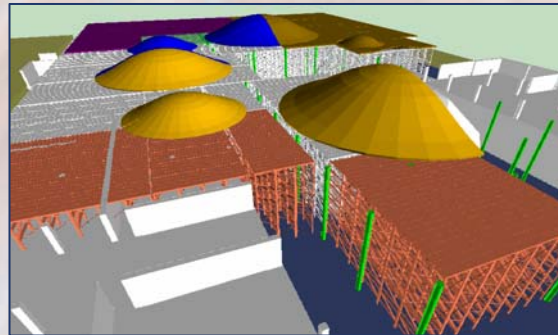
University – Industry partnership

CIFE objectives include:

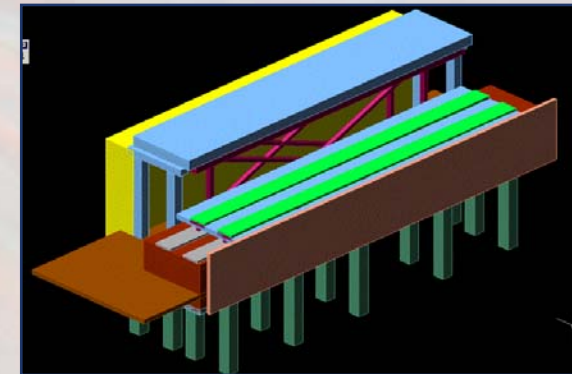
- **Education** - to increase awareness of the value and costs of Virtual Design and Construction for practitioners and Stanford students



Disney



Webcor



Obayashi

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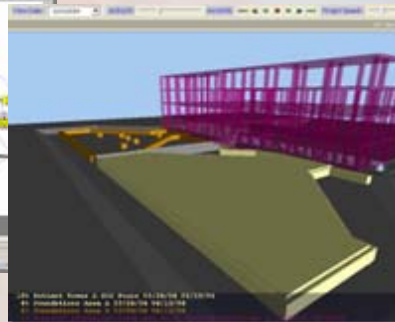
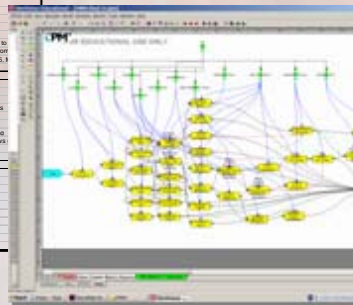
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CIFE objectives include:

- **Research** - to develop and test innovative new ways to model, visualize, analyze and evaluate the multidisciplinary performance of design-construction projects



Product	Organization	Process
150 students	Excellent stakeholder coordination	on time
1 year < 75% of 2002 comparable	Developer: open-book design, build on budget	good product
use < 75% of 2002 comp	for noise windows closed < 30dB	design
why >10% better than ASHRAE	stands Design QA	build
open space on site	Construction QA	operate
recycled construction materials	Operations QA	Reuse any trees that need to be disturbed > 40 feet from environment
environment		Construction noise only 8-5, 1
at neighborhood level recycling		
interior/floor	contractor	architectural design
panels	student reps	MEP design
entirely post	architect	structural design
y per basement	consultants	CM management process
on < stairs	owner representative	programmed planning
ion interior-facing corridor	SU operator representative	construction
interior use features	Regulatory agency: Santa Clara county	interior and exterior finishing
department	Community representatives	Design construction reviews
	SU PM	PM/QA supervision
		Safety review
enable observation of functions	FTE total (by month)	schedule conformance
Recycling practice	total (by month)	budget conformance
energy use over year-1	Research volume (FTE-hours/month)	construction rework <0
water use over year-1	RFI count & latency	safety LTI < 0
Interior Noise (85)	ECOs/month	design rework < 20%
modular application (M.L.)	staff turnover	close < 40
air quality (particulate/c)	Coordination volume (FTE-hours/week)	CM pair schedule
	Decision wait time (days)	



Swinerton

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The CIFE mission is to be the world's premier academic research center for Virtual Design and Construction of Architecture - Engineering - Construction (AEC) industry projects.

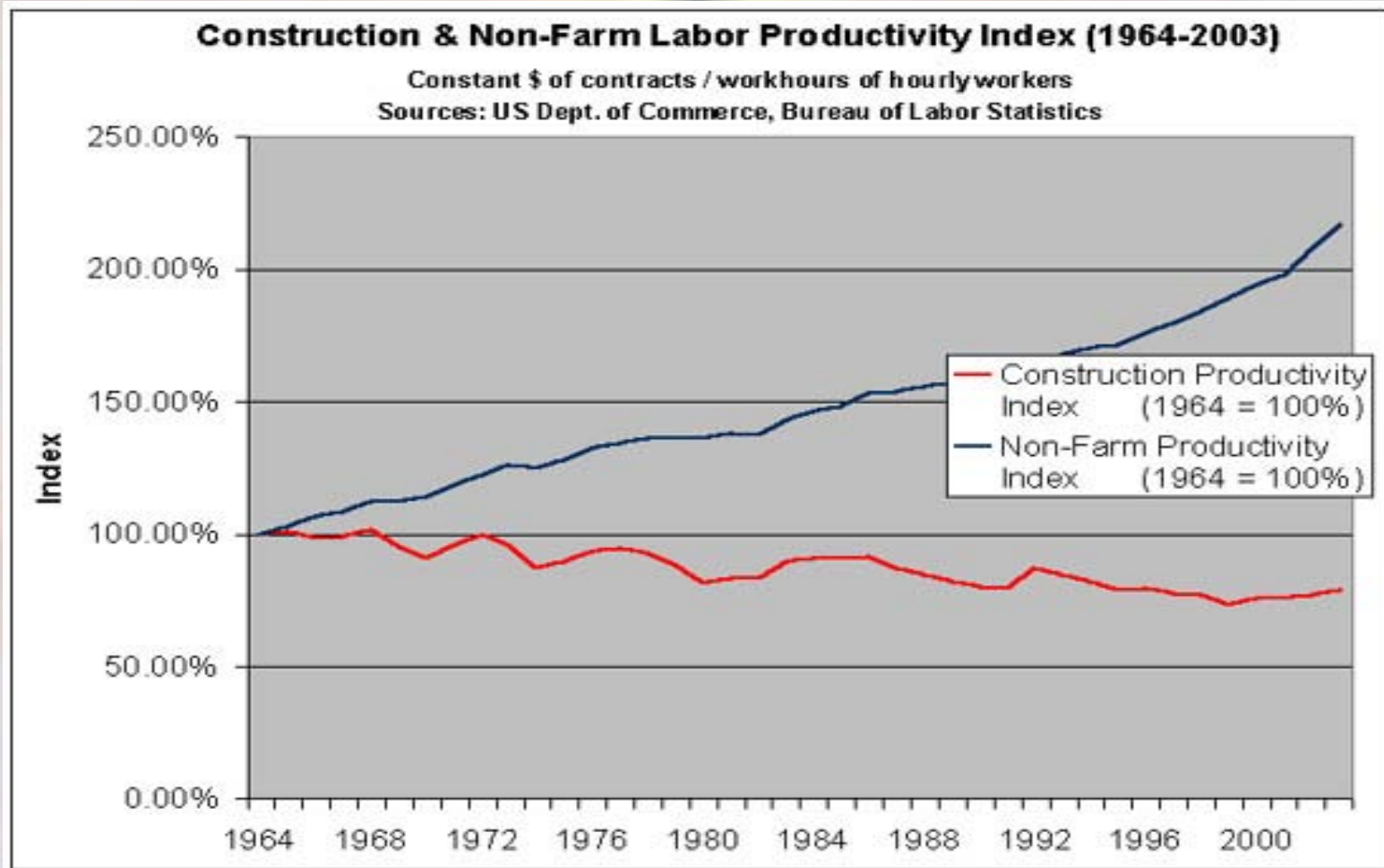
Virtual Design and Construction (VDC) is the use of multi-disciplinary performance *models* of design-construction projects, including the *Product* (i.e., facilities), *Organization* of the design - construction - operation team and *Work Processes* in order to support business objectives.

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“Delta” of CE: Productivity (1964-2004)

(Constant \$ of contracts / workhours of hourly workers)

sources: US Bureau of Labor Statistics, US Dept. of Commerce



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CIFE Breakthrough goals for AEC

	Practice: 2005	Goal: 2015
Schedule	1-6 y Design ~18 mos Construct +- 5-100%	1 y Design <= 6 mos Construct +- 1-5%
Cost	+- 5-30%	+- 1-5% variance - 20% mean/ft²
Function	+- Big	+- Very small
Safety	Good	Good – better
Sustainability	Unsustainable energy use (probably)	Better: > 20% better than baseline
Globalization	Some	>= 50% of supply and sales

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Will current practice get us there?

Can this project be built?
on time? on budget?
with this schedule?







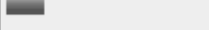
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VDC supports all phases of design and construction

- To complete survey: see *VDC/BIM Use Survey* at <http://cife.stanford.edu>

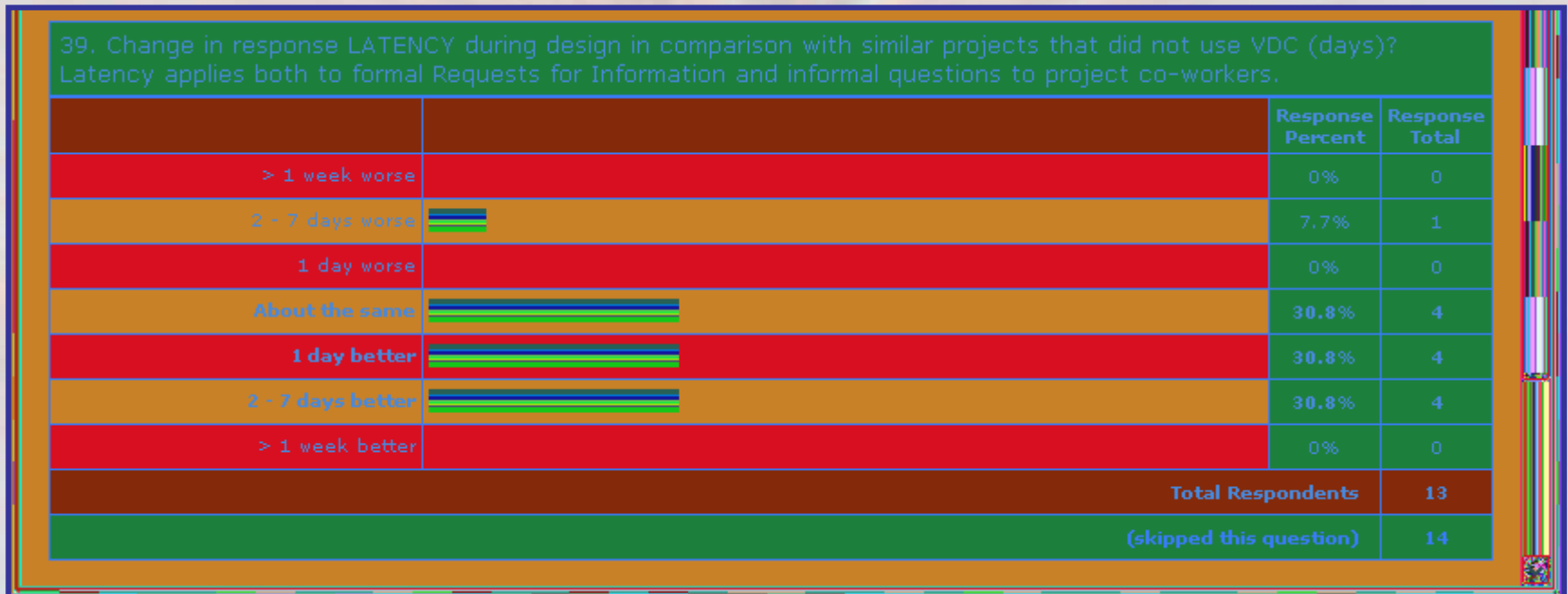
9. In the past year, in which of these areas did you place significant attention for developing VDC capabilities (select all that apply):

		Response Percent	Response Total
Pre-project planning		54.5%	12
Support conceptual design		54.5%	12
Support design definition		54.5%	12
Support construction document development		45.5%	10
Support field construction management		50%	11
Support operations and maintenance		4.5%	1
Other		22.7%	5
Total Respondents			22
(skipped this question)			5

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VDC Can Improve Latency

Latency = time from asking a question to getting a “good enough” response to proceed



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Will current practice get us there? VDC seems to help ...



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