

BIM & The Architectural Team

*Integrated Project Delivery through
Building Information Modeling (BIM)*

1/17/2008

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Topic: BIM & The Architectural Team

Presenter: Allan Partridge



Transitioning to BIM

5 Emergent Categories of BIM Evolution (John E. Taylor, Stanford University)

1. Visualization

Sectional Perspectives, Renderings

2. Production

Floor Plans, Sections, Elevations, Schedules, Area Calculations, Annotation Coordination, etc.

3. Coordination

Inter-Consultant Data Sharing, Interference Detection, 3D Objects and Data from Consultants

4. Analysis

Structural, Thermal, Egress, Simulation(s)

5. Supply Chain Integration

4D Simulations, CNC Fabrication, FM, 'Intelligent' Job Sites



Transitioning to BIM

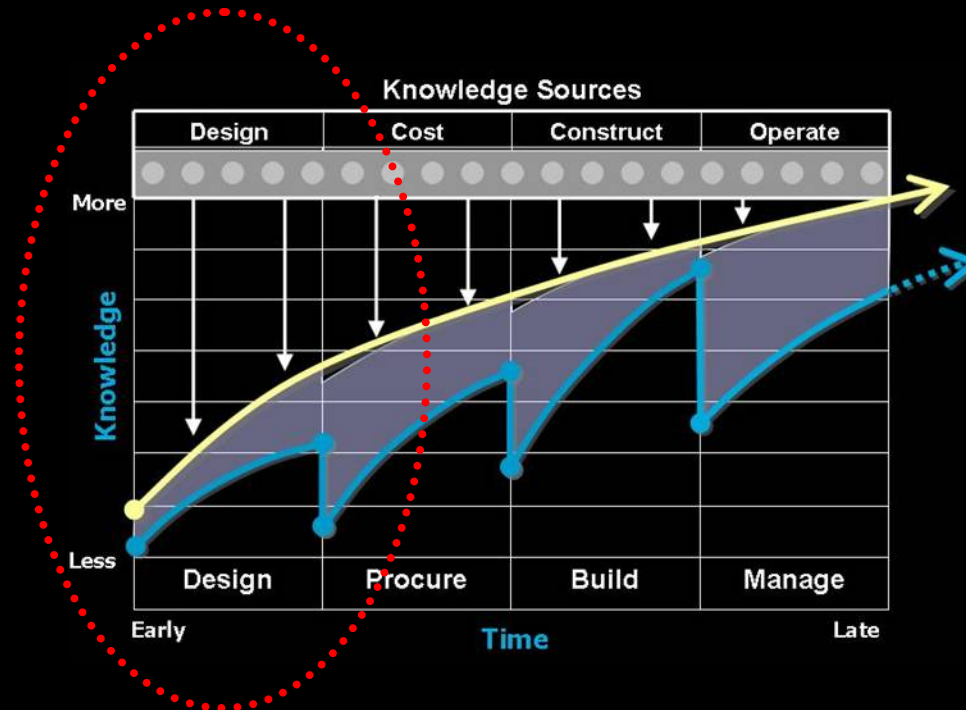
TRAINING FOR CHANGE

BIM means changes

- Changes in the way we work
- Changes in project organization
- Changes in staffing needs: **Generational opportunities vs Generational challenges**

Key Tools

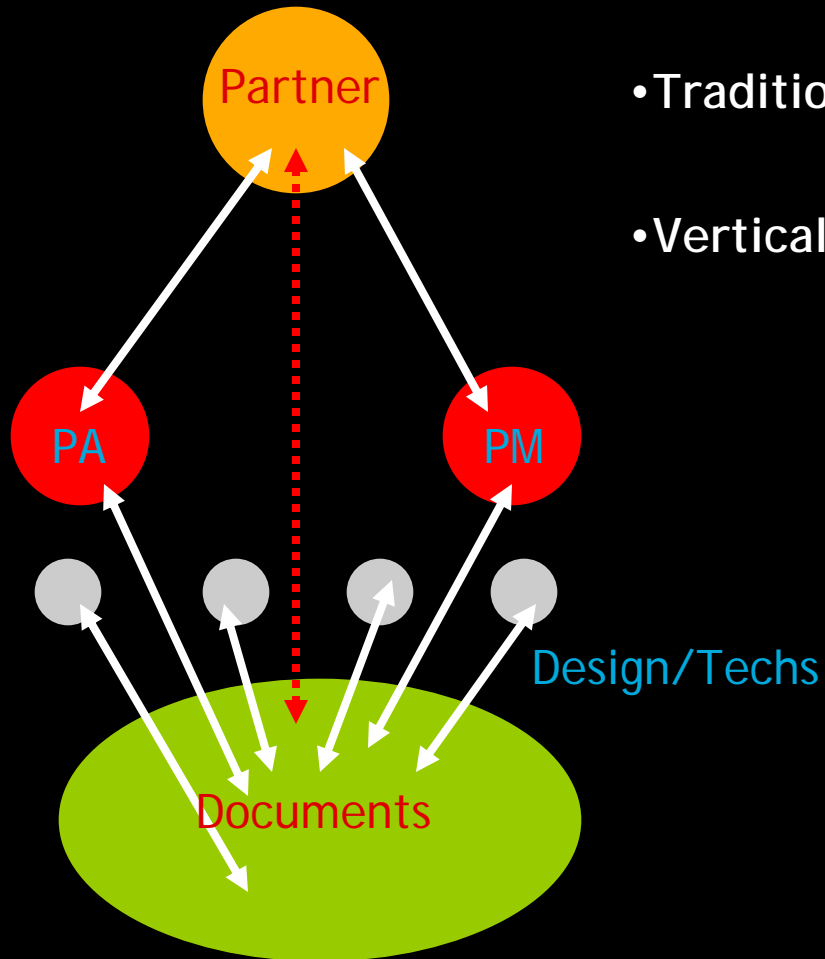
- Awareness about BIM
- Education about BIM



Transitioning to BIM

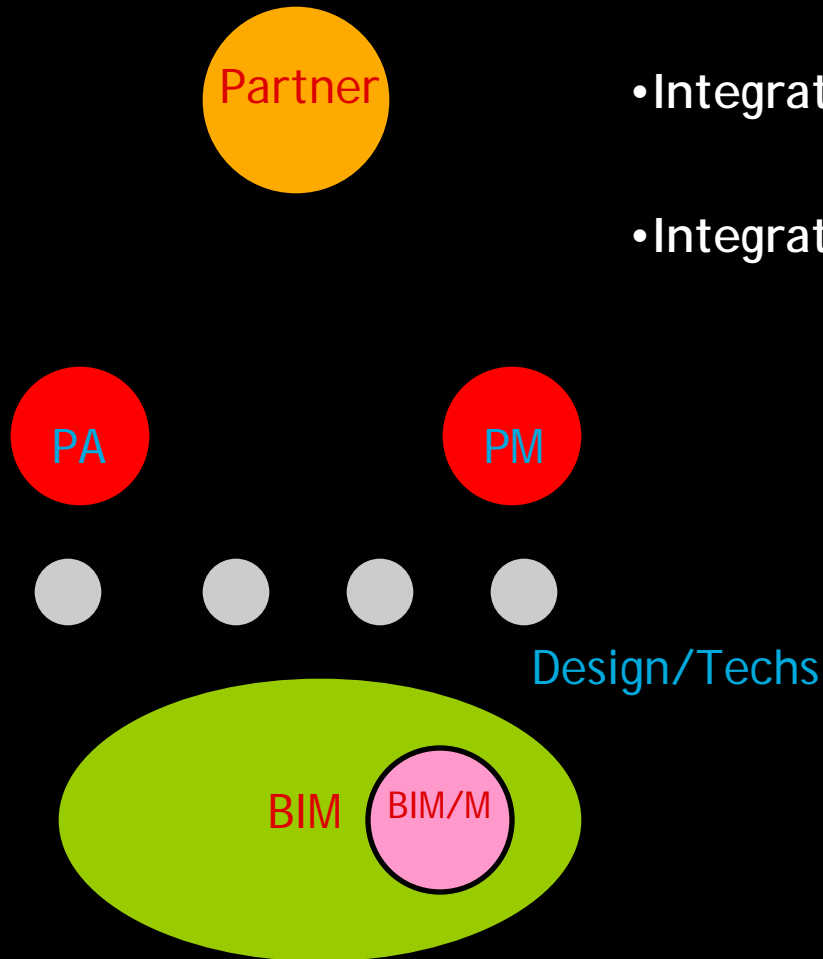


Transitioning to BIM & Integrated Practice



- Traditional Team size 3 - 5
- Vertical process

Transitioning to BIM & Integrated Practice



- Integrated Team size 3 - 4
- Integrated process



4 Benefits

1. **Focus** on Buildings not Drawings
2. **Better Understanding** of the Design
3. **Productivity** Gains
 - 2001 70% (100% CAD Projects)
 - 2002 74% (First 2 BIM Projects)
 - 2003 73% (50% BIM Projects)
 - 2004 74% (75% BIM Projects)
 - 2005 74% (100% BIM Projects)
 - 2006 76% (100% BIM Projects)
4. **Improved** Building Accuracy

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4. **Improved Building Accuracy**

Measured by **Constants** not **Variables**

- \$ Salary Variable
- \$ Construction Variable
- Team Size Variable
- **Time is a Constant**
- **Area is a Constant**
- **SF/HR only Measurable Constant**

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SF/Direct Hr

SF/Total Hr

30

21

28

20

26

19

31

23

32

24

41

31

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Productivity Gains

	SF/Direct Hr	SF/Total Hr
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• 2002 74% (First 2 BIM Projects)	28	20
• 2003 73% (50% BIM Projects)	26	19
• 2004 74% (75% BIM Projects)	31	23
• 2005 74% (100% BIM Projects)	32	24
• 2006 76% (8.5% Increase over '01)	41 (26%)	31(48%)

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7 Factors of Implementation of Integrated Workflow

1. Firm Size

- Many Factors; project size, technology, training/support, etc.

2. Project Sizes

- Small projects are ideal for implementation - "spatial size" is critical

3. Architectural Complexity

- More detail, shapes and mass = more time

4. Project Types

- Choose type that might have a high degree of repetition

5. Scope of Services

- More effort needed at the front end of a project, allow more time

6. Firm Locations

- More offices in different locations; more difficult to implement but not impossible

7. Firm Culture and Age

- How well does my firm respond to change, who will support the initiative?

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4 Keys to Successfully implementing change

1. Plan

- Use 7 factors to implementation; take into account those affected.

2. Communicate

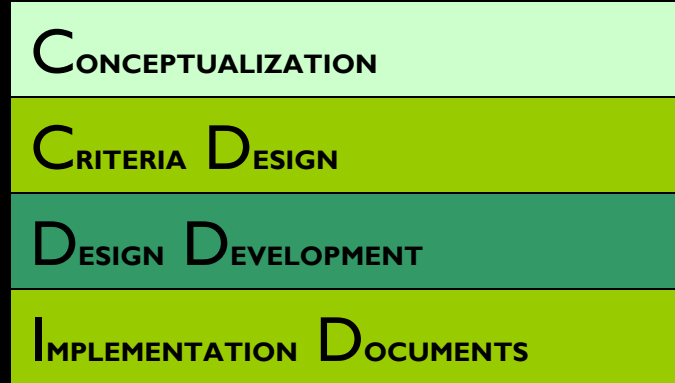
- Know the plan, share it with the entire office
- Partners/Principals: what will this mean for the business of architecture?
- Team: What is going to mean for the design and documentation of architecture?

3. Train

- Balance between dedicated training and on the job training
- Encourage all to avoid jumping back into their comfort zone
- Record, monitor, analyze and communicate on the pilot project

4. Support

- Create an environment of "risk mitigation" vs "risk aversion"
- Use pilot team to "seed" other teams
- Set up internal network and protocols and meet regularly



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3 Approaches

1. Horizontal Approach - (to Conceptualization (C)/Criteria Design (CD))

- All views oriented to plan are produced using BIM
- Lessens the learning curve, modeling time and "model it all" mentality
- Take advantage of BIM early with mitigated low risk
- Utilize traditional CAD programs to develop remaining phases of work

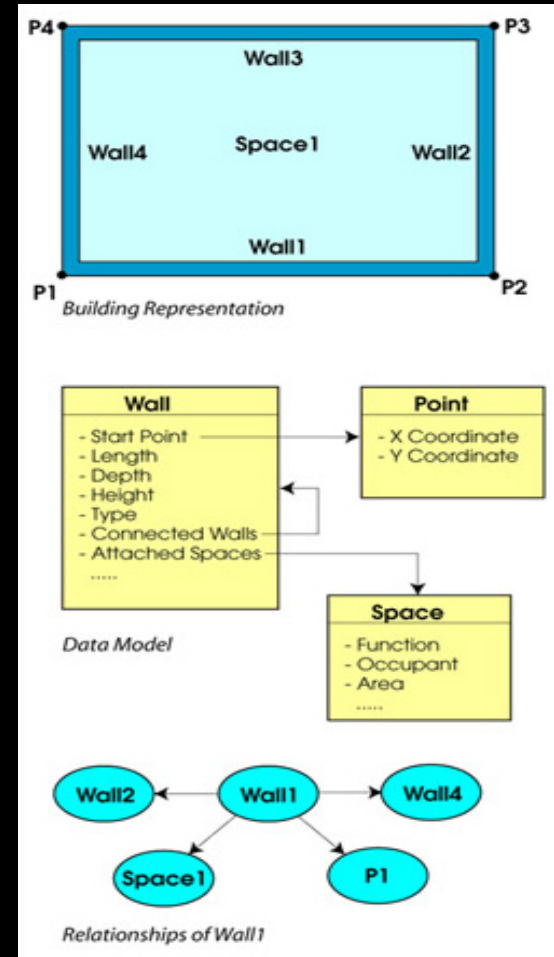
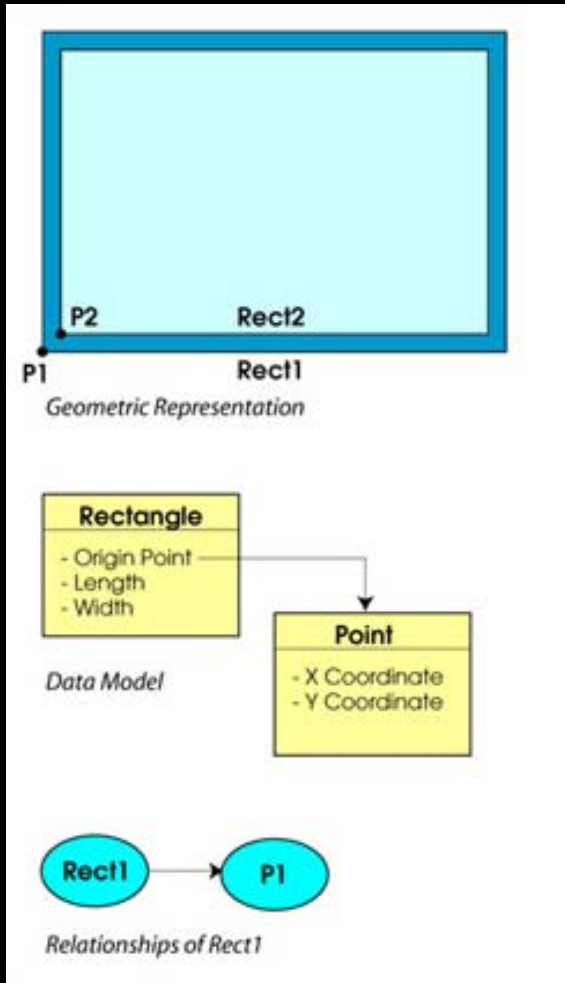
2. Horizontal/Vertical Approach - (to (C)+ (CD) + Design Development (DD))

- All plans, building sections and elevations produced in BIM to 100% DD
- Utilize traditional CAD programs to develop Implementation Documents ("CD's)
- Managed buy-in - allows for an "Exit Strategy" if things are not going well
- Relatively mitigated low risk taking greater advantage of BIM

3. Post-It Approach - ("Progressive" C + CD + DD + ID)

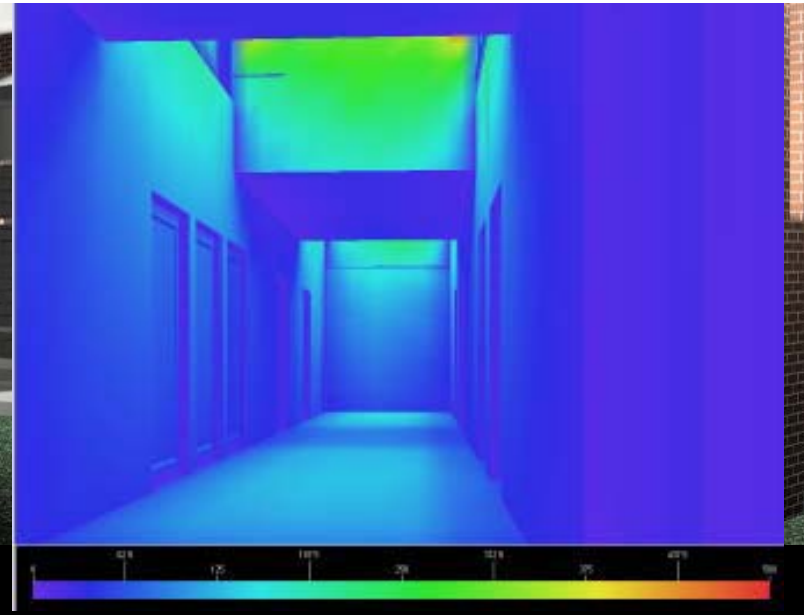
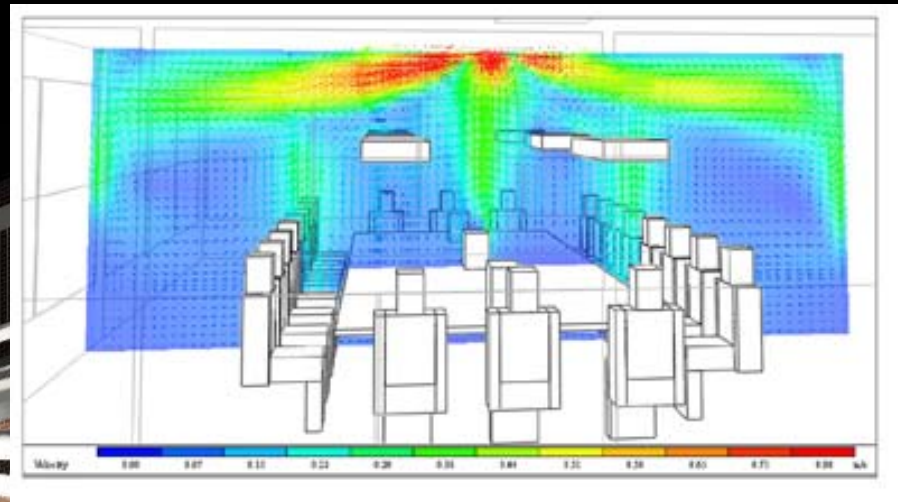
- Lessens expectations
- Allows the design to mature
- Reduces "throw away"
- Progressively mitigates the risk and still allows for an "Exit Strategy" if needed.

BIM + Sustainable Design Strategies



BIM + Sustainable Design Strategies

1. Design Optimization
2. Visualization
3. Daylighting
4. Energy Analysis
5. Computation of M
6. Specification Man
7. Reducing Waste &



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Questions

