

# The Thankless Job of a BIM Manager

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Director of Operations – US CAD Hawaii

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US CAD - Hawaii

- Director of Operations

## Autodesk University

Attendee (1994 – present)

- 19<sup>th</sup> consecutive years

Presenter (1997 – present)

- 16<sup>th</sup> consecutive years

## Autodesk User Group International, Inc.

- President 2002 & 2005
- Board of Director 1999 – 2005
- Education Manager 2006 – 2009

## Local User Groups

Aloha State AutoCAD Users Group, Hawaii Revit Users Group, Aloha State Civil Users Group



# Class Summary

The thankless job of a Building Information Modeling (BIM) manager can become overwhelming at times. The daily pressure from upper management and the tedious task of keeping the CAD operators in your department productive is enough to drive you insane. This class will motivate you to bring out the best in you and your company. We will discuss some examples and try to analyze new ways of making your department run smoother, more productively, and more cost-effectively. Balancing your department's workload, making time and finding money for training, and implementing and keeping your CAD standards current is a very difficult job. If learning how to balance the entire picture and still have a life seems like an impossible task, you are not alone; there are thousands of BIM managers who go through this every day.

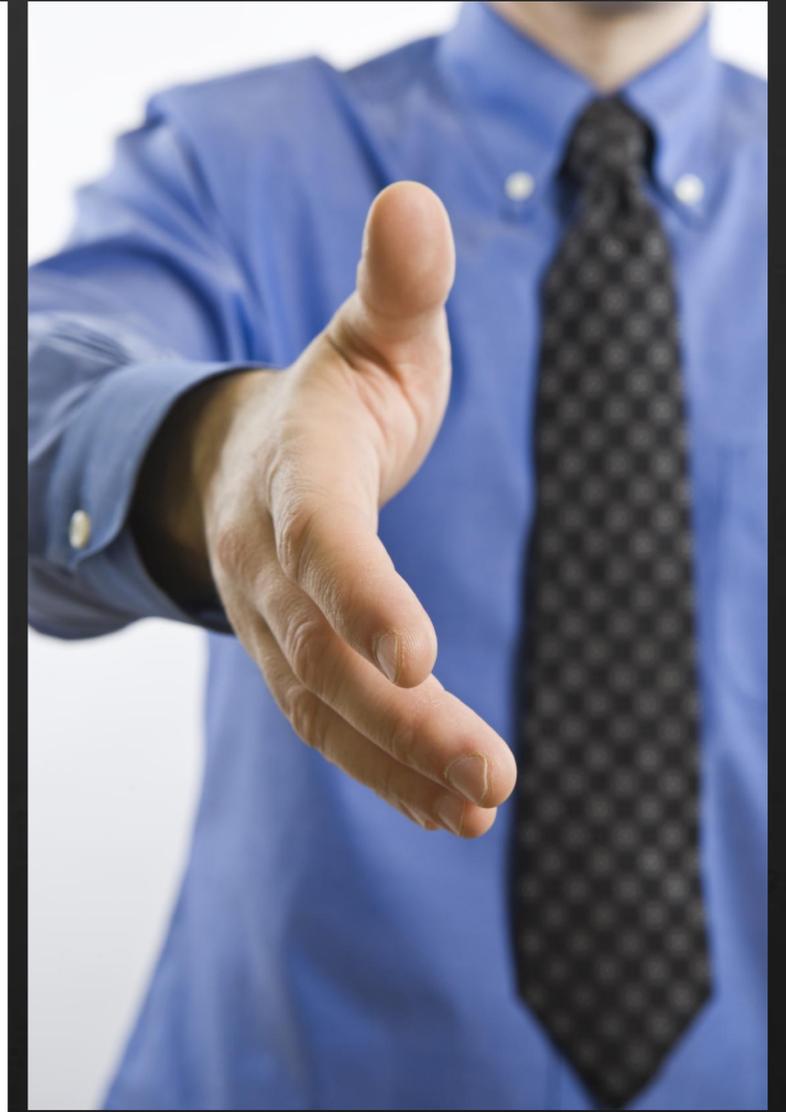
# Learning Objectives

At the end of this class, you will have a better understanding of:

- How BIM affects business and management models
- Examine cloud computing and its effects on our business
- Understand the BIM lifecycle
- Identify new technologies and how they are changing the BIM process
- Getting the most out of your workforce

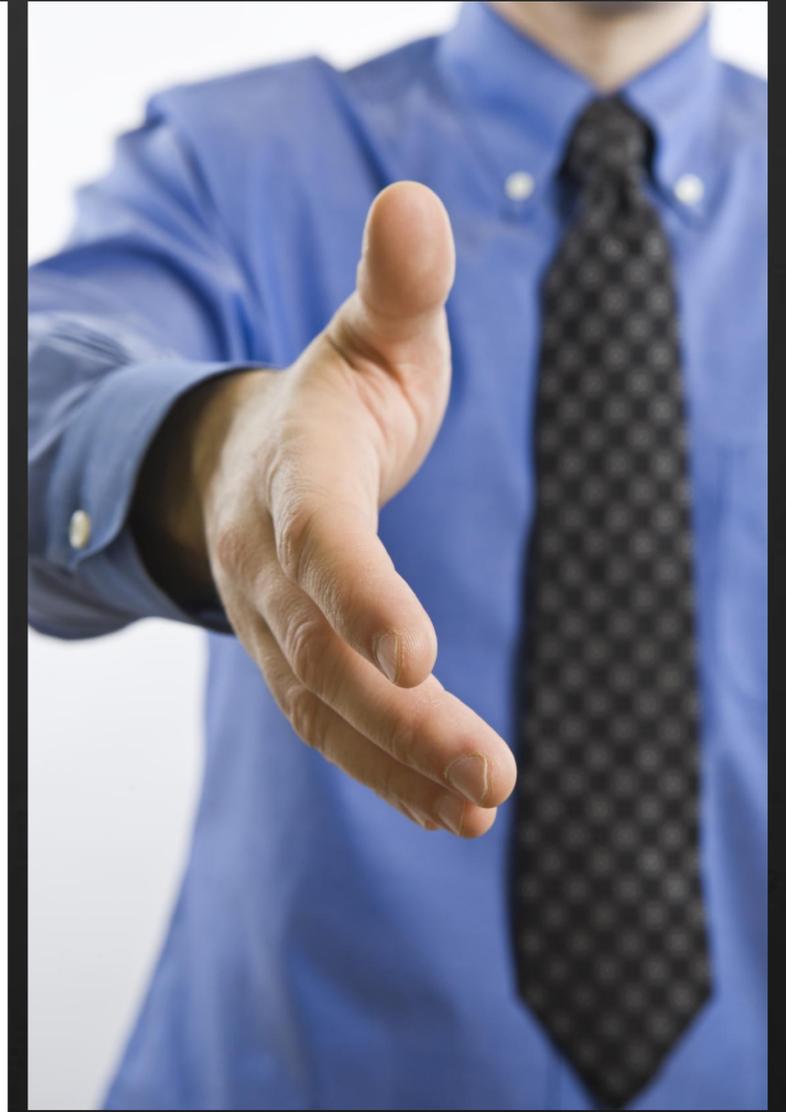
# Aloha neighbor, meet your fellow Peers...

- Please introduce yourself to the person to the right of you, left of you and behind you.
- Tell that person your name, city and state, industry, and years of experience.
- You will have about five minutes



# Aloha neighbor, meet your fellow Peers...

- Name
- Company name
- Job Title
- City
- State
- Industry
- Years of experience



# How BIM affects business and management models

BIM is **not** just 3D models

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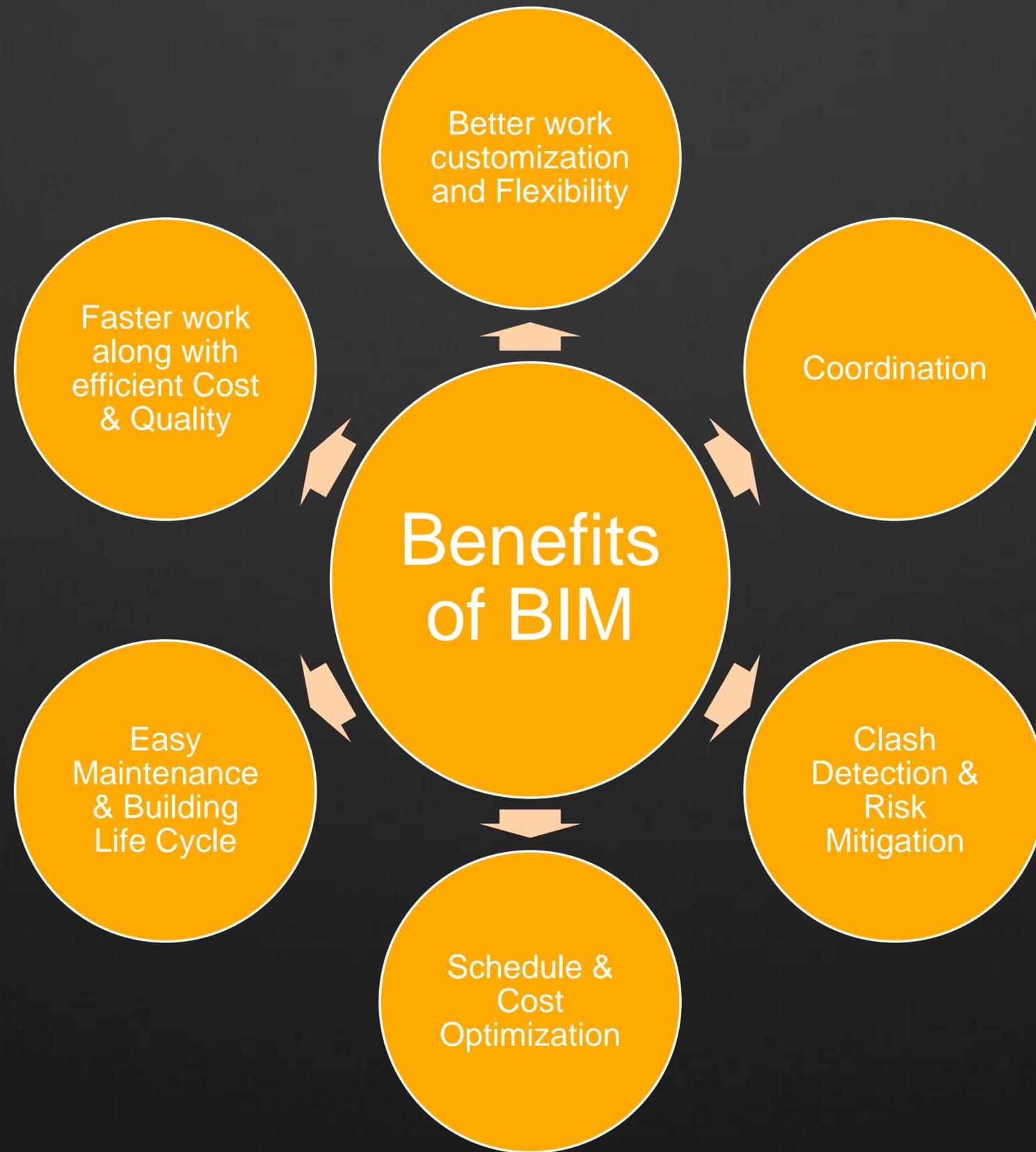
BIM is **not** just Revit

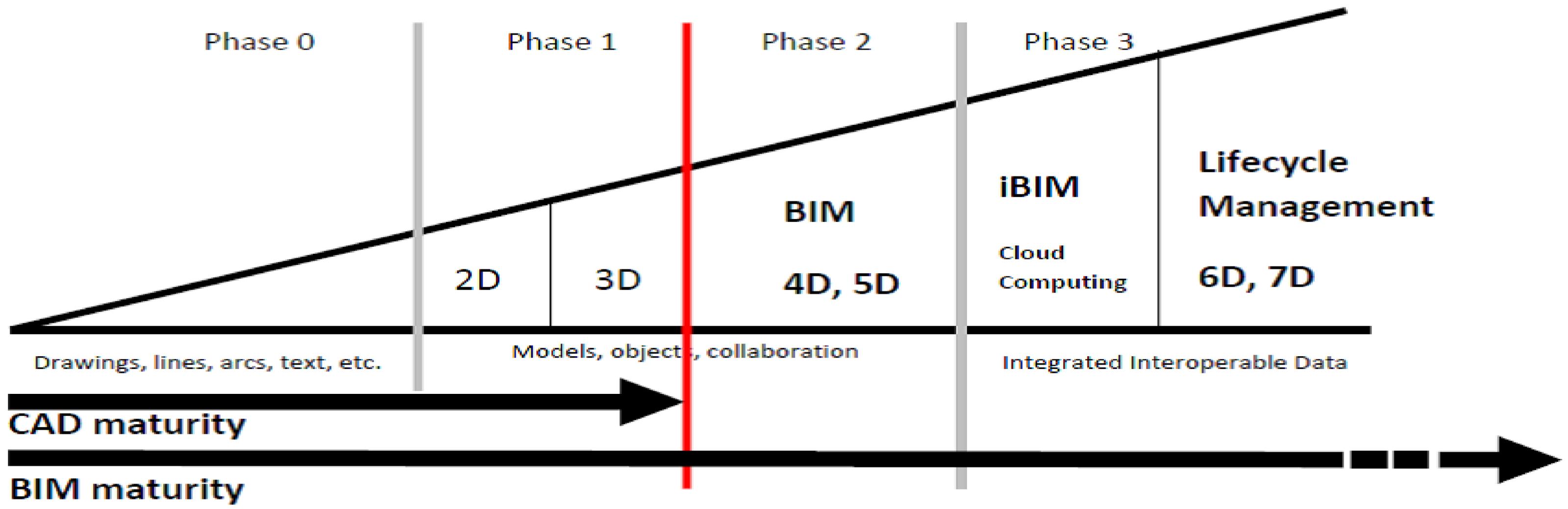
BIM is **not** just Revit

No **one** BIM tool can do everything

# BIM is Just 3D CAD

- A building information model, although potentially full of valuable building-related data, is essentially a 3D model of the geometry and systems required to construct and analyze that building and its internal systems.
- Instead of having wall data in 2D CAD files, ducting calculations in a spreadsheet, and solar analysis in yet another external file, you'll coordinate a singular BIM project that combines all this data.
- That is the technology-specific side of BIM. The other side is the changes that BIM will bring to your workflow. Managing a BIM project — rather than a drafting project and a ducting project and a solar analysis project — means that your work processes will be very different. And that difference in process management, much more so than the software itself, is what makes switching over to BIM so vexing for those companies undergoing the transition process.





# Like any other 3D CAD tool you attempt to manage

*BIM should be thought of in these terms:*

- How can my users learn the software?
- What standards and procedures will we have to change?
- How quickly can we get staff up to speed?
- How will we manage all the new file types (viewers, document control, etc.)?
- How will we collaborate with outside clients/vendors?

*The more you think about BIM in these terms, the more clearly you will realize that moving to BIM is just like moving to any other new software platform and that training, coordination, and standards are the truly difficult part of the process*

# BIM Balance is Key

The firms that balance all their CAD tools best are those that realize BIM is simply one facet of their overall CAD implementation.

*The characteristics of these firms that I've observed often include the following:*

- Projects are completed using the best tool for the job.
- BIM isn't viewed as a magical solution that fixes all CAD problems.
- BIM is planned for and adopted methodically.
- Other CAD tools are still aggressively supported.

*Not surprisingly, the CAD managers who embrace these methods seem to be the ones doing the best job of integrating BIM into their companies*

# Risk – BIM for Risk reduction

- During design and construction phase, potential spatial conflicts may arise between building components. It is not easy to identify or predict these conflicts using 2D or 3D layouts. But, 4D model identifies various issues related to space, schedule and sequencing, and resolve them ahead of the construction process.
- Integrated with BIM modeling, 4D scheduling helps the owner as well as project team to easily visualize time constraints and opportunities of improvement and investment in the project.

# Schedule - BIM for 4D Model

- BIM allows developing different construction scenarios by visualizing the scope with scheduling software. BIM also permits adding different equipment such as cranes, hoist, etc. to the model and allows all project participants to review, understand and optimize the sequence of the construction operations and the project schedule.
- 4D model is a further development over 3D model. By adding the schedule date to the model components, or link model to software like Primavera or MS Project we can generate 4D model.
- Thus team can improve the plan and integrates the communication among various divisions. With the progress of time, project team programmatically links schedule to BIM model to evaluate various construction options to make the optimum decision. It challenges and changes many of the practices of conventional scheduling.
- 4D model enables the scheduler to view the entire construction site in a nutshell. The scheduler is able to move around, look outside, inside and under the building and verify the progress of project. It helps the scheduler to detect inconsistency and avoid visual incongruities in the representation.

# Recourse – BIM for Maximization of Critical Resources

- 4D model allows the project team to evaluate various alternatives resources and scopes of work over a period of time to optimize the resources and labor accordingly and able to increase the site productivity.

# Budget - BIM for 5D Model

- 5D model is a further development over 3D and 4D model. Integrating human resources, equipment and material resources and cost with the BIM model, 5D model helps to better schedule and cost estimate of the project.
- 5D BIM also monitors procurement status of project materials.

# Quality

- The BIM quality control mechanism facilitates the analysis of 3D models in order to check integrity, quality as well as physical safety of the designs.
- While BIM technology offers easy visualization along with virtual walk-through functionality, the quality control services highlight potential flaws or weaknesses in designing.
- Additionally, it reveals the clashing parts and ensures that the 3D model conforms to the construction codes and the organization's best practices

# Phase One



**Assess Phase** – Gather and Analyze Information on Corporate Culture and Company Goals; Existing People, Processes, and Workflows; and the Goals for the Implementation.

**Listen, Learn and Share about the “entire workflow process”**

# Phase Two



**Plan Phase** – Develop a Comprehensive Implementation Plan Detailing: What Work will be Performed, Who will Perform the Work, When will the Work be Performed?

# Phase Three



**Solve Phase** – Carry out the Implementation Plan Including: Software Installation and Optimization, Key-user and End-User Training, and Project Mentoring.

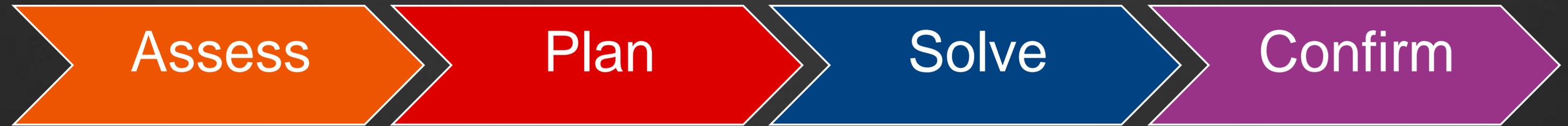
# Phase Four



Confirm

**Confirm Phase** – Evaluate the Success of the Implementation and Plan for the Future Including: Ongoing Training, Mentoring, and Support Needs; The Process of Adding New Users, Software Updates, and Upgrades.

# Four Phases



**Assess Phase** – Gather and Analyze Information on Corporate Culture and Company Goals; Existing People, Processes, and Workflows; and the Goals for the Implementation.

**Plan Phase** – Develop a Comprehensive Implementation Plan Detailing: What Work will be Performed, Who will Perform the Work, When will the Work be Performed?

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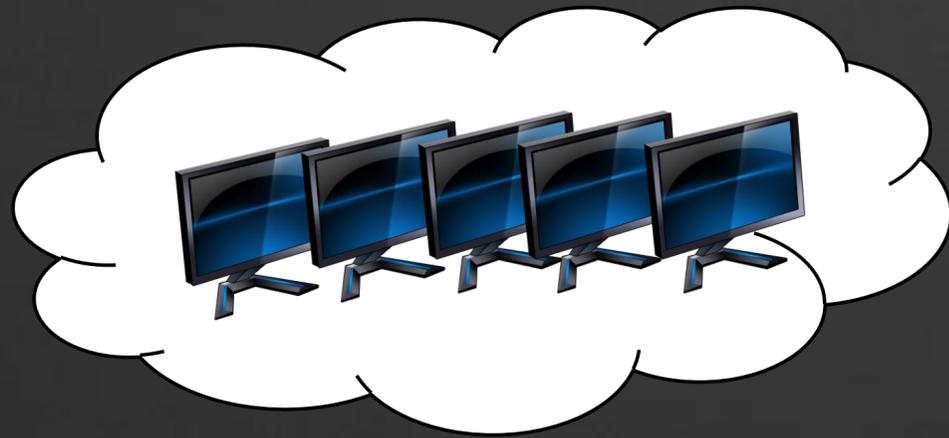
# Manager Chat

How BIM affects business and management models



# Examine cloud computing and its effects on our business





# The Cloud

Cloud = High growth market, short & long-term implications for organizations of all sizes

- IT & business decision-makers seeking Cloud alternatives
- Confusion & complexities create consulting opportunities
- Proliferation of players, “Cloud Rush” effect, causing confusion and integration challenges creating new Cloud aggregation/broker opportunities
- PaaS/IaaS resources offer new custom and vertical market applications development opportunities

# What is Cloud Computing?

- Most of us have a rudimentary understanding of the “cloud”.
- Taking an existing traditional software application, whether client/server or web-based and posting it to the Cloud via a virtual server is NOT true Cloud Computing, but “cloud washing”
- True cloud computing is centered around delivering secure, rapid and transparent “standards-based” information with the added benefits of collaboration among individuals.
- The level of collaborations is virtually unlimited to location, time, language, measurement, etc.

# What is Cloud Computing?

- Imagine a cost estimating program that enables an unlimited number of individuals to work on the same estimate, or work exclusively on a component of a much larger project, simultaneously, in varying languages, units of measure, and currencies.
- At the same time the team can track, approve or disapprove changes in real-time, while continuously monitoring and managing who changes what and when.
- This capability exists today, solely due to the advent of cloud computing and associated advancements in information sharing technology beyond spreadsheets and relational databases.



How fast will the  
market migrate to  
Cloud services





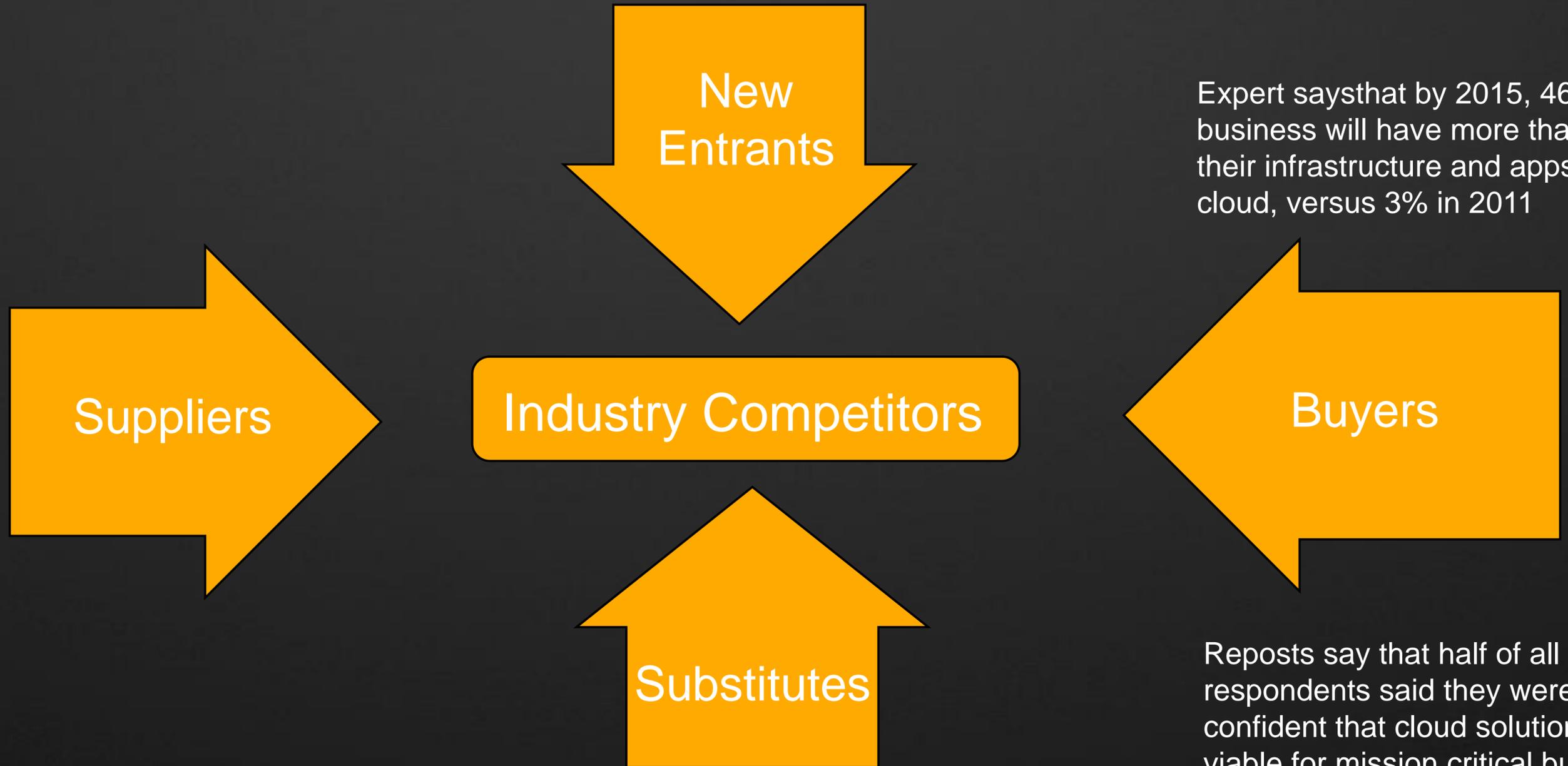
How fast will the market migrate to Cloud services

What are the business model impacts

Who are the new partners and in what timeframe



Reports predicts that Cloud IaaS market to grow by 48% through 2015.



Expert saysthat by 2015, 46% of business will have more than half of their infrastructure and apps in the cloud, versus 3% in 2011

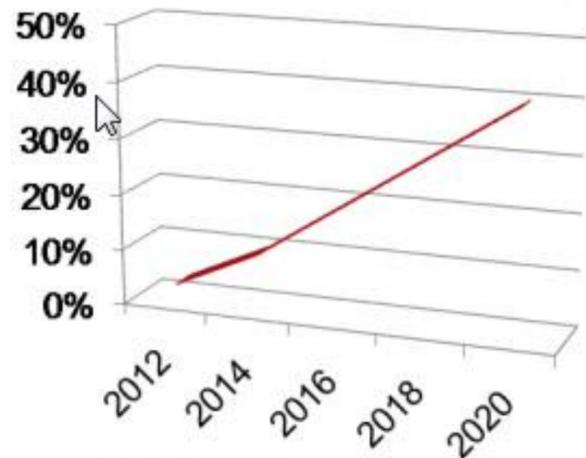
According to IDC by 2015, 24% of all new SW purchased will be of service enable software with SaaS delivery being 12.1% of world wide SW spend.

Reposts say that half of all respondents said they were confident that cloud solutions are viable for mission critical business applications

Professionals are predicting cloud based apps will replace 2.3% enterprise IT spending in 2014 to 14.5% in 2020

## Two Big Drivers for VARs

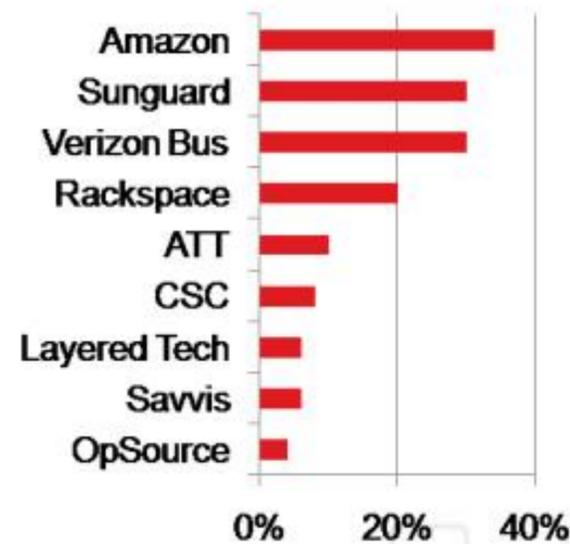
New Business Model - % Spending Replaced by Cloud Skyrocketing



Fuld & Company



New Providers - % who use each company is exploding



External Service Providers Consider for IaaS; Gartner Group 2011



## Business Model Impacts - Cloud Services

	2013 -16	Total
Infrastructure Revenue	\$100 per year	\$400
Gross Margin	\$15 per year	<b>\$60</b>

In Millions

### Mitigating Factors for Margins:

- Margins on legacy HW will continue to decrease
- New infrastructure for private cloud brings higher margins
- VAR may not get all cloud revenue if customer goes retail
- Just taking a piece through referrals won't cut it – developing value added cloud services will be a must to preserve margins

	2013	2014	2015	2016	Total
HW Revenue	\$95	\$90	\$85	\$80	\$350
HW Gross Margin	\$14.25	\$13.5	\$12.75	\$12	\$52.5
Cloud Services Revenue	\$1	\$3	\$6	\$10	\$20

### Cloud Margin – Can it Make up Difference?



# For example...BIM9, Autodesk Cloud360



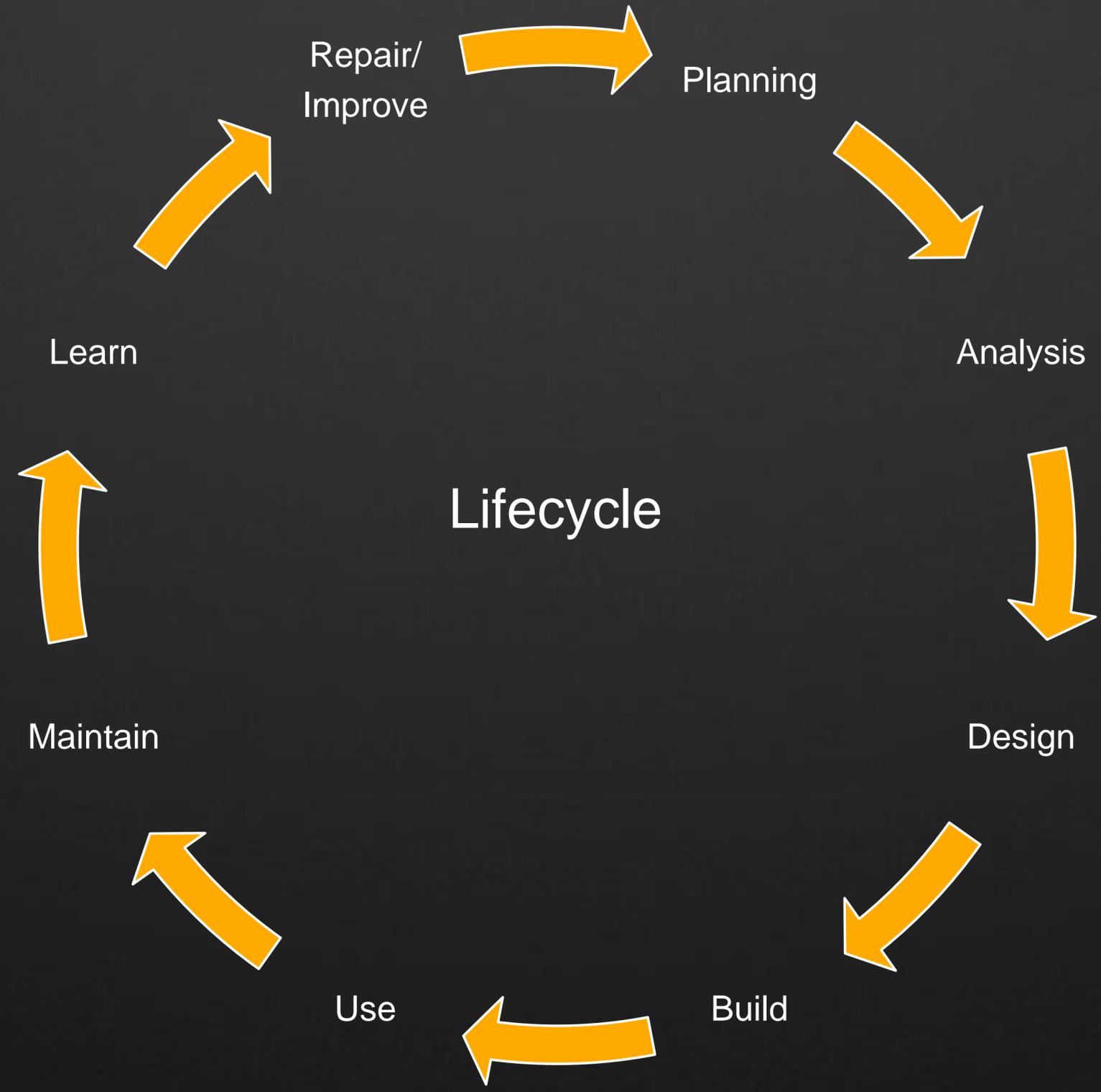
Autodesk® 360 

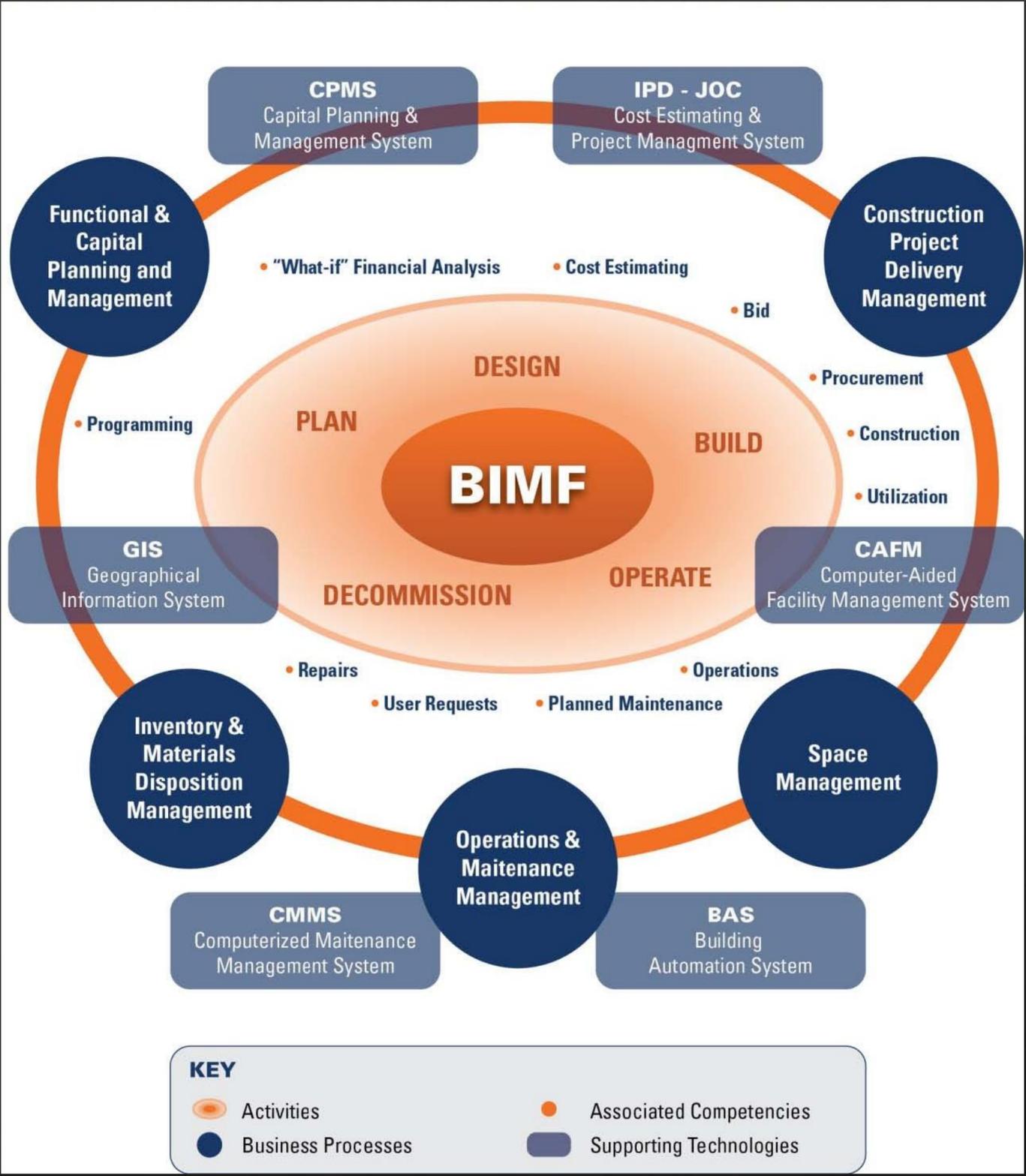
# Manager Chat

Cloud computing and its effects on our business

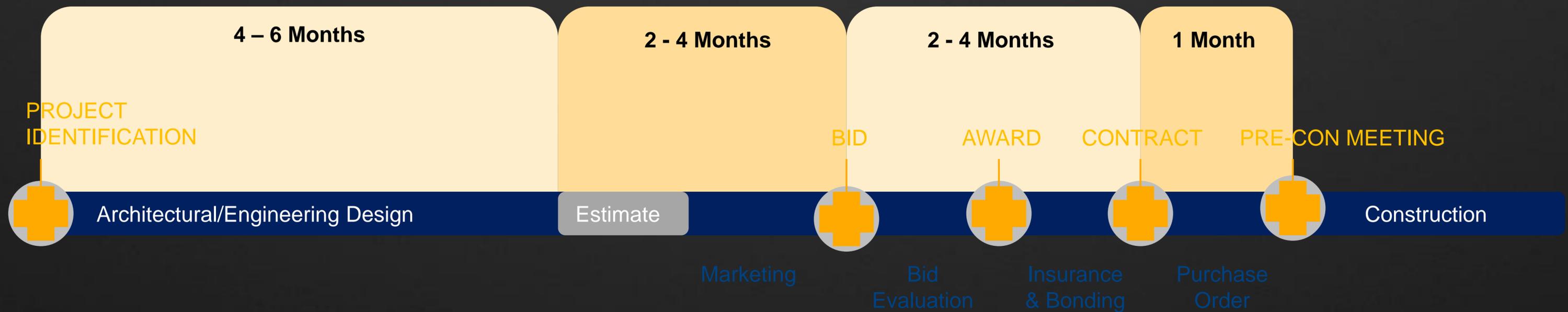


# Understand the BIM lifecycle





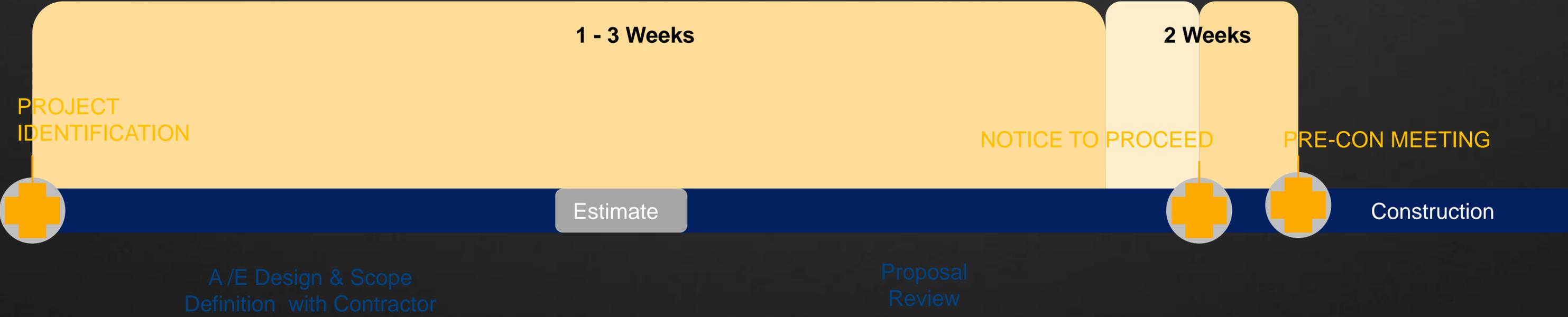
# Traditional Construction Procurement Process: 9 to 15 months



<http://buildinginformationmanagement.files.wordpress.com/2012/11/ifma-october-20121.pdf>

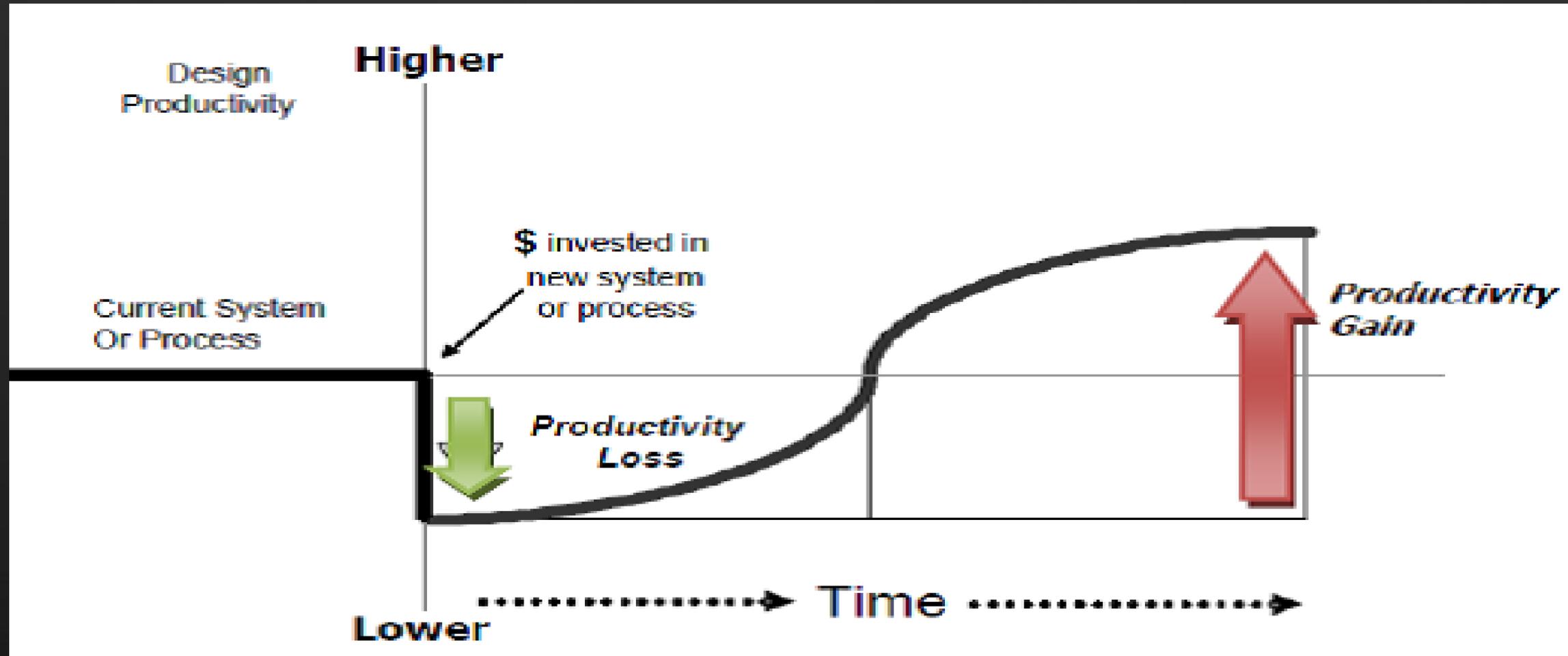
# The New Construction Procurement Process:

3 to 5 weeks



<http://buildinginformationmanagement.files.wordpress.com/2012/11/ifma-october-20121.pdf>

# Investing the time and loss of production...



# Courseware

Ascent

[http://www.ascented.com/AscentEd/media/AscentEdGeneral/ASCENT\\_Courseware\\_Release\\_Roadmap.pdf](http://www.ascented.com/AscentEd/media/AscentEdGeneral/ASCENT_Courseware_Release_Roadmap.pdf)



# How we can increase productivity through BIM?

- BIM process is likely to enhance productivity throughout the building lifecycle. The ability to design complex buildings virtually, working closely with all engaged stakeholders in real time, ensures feature optimization and high quality physical construction and production efficiency. Enhanced productivity is common to all sectors that have adopted similar modeling technologies in their supply chain activities.

# Factors influencing productivity

*There are many factors influencing the productivity and some them are:*

- Planning and control
- Lack of Information on time
- Rework
- Clashes with different disciplines
- Sharing the information at correct time to correct people
- Communication
- Language barriers
- Personal matters such as mental satisfaction
- Environment – work and @ home

*Most of the above reasons can be overcome by implementing BIM on the project.*

# Enhanced Planning and Control

- Model will help to develop different scenarios while developing the construction methodology and ability to link the model with the planning software like Primavera, MS project (Which are commonly used) will support planning and updating the program visually.

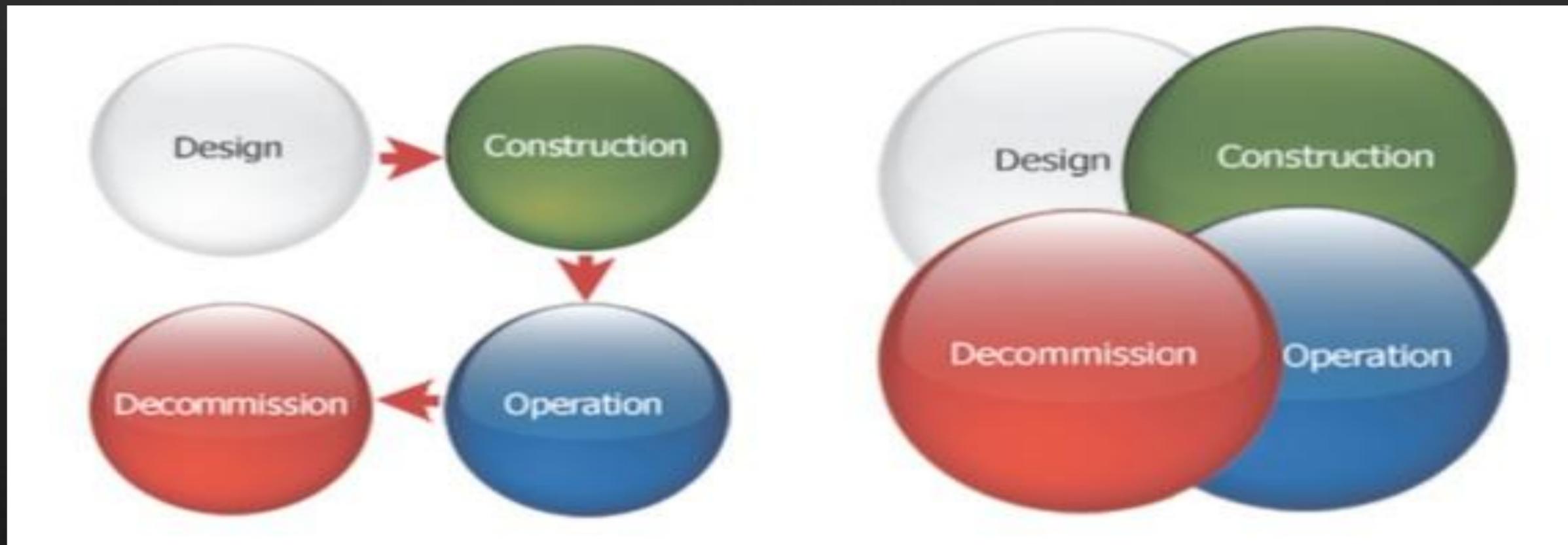
# Correct Information on time and to correct people.....

- The ability to store information about all the elements in the model and model is developing at the initial phase of the project; it is possible to provide relevant information to all stakeholders at the construction stage.
- Studies showed that number of RFI's considerably reduced at the construction stage where BIM utilized.

# Clashes with different disciplines...

- Possible chances of clashes with different disciplines such as Structural, Architectural, MEP can be settled by the model at design phase.
- Reworks due to design changes and clashes with different disciplines can be avoided
- Client approved the design and facilities after visualizing the model
- Clashes are removed while modeling

# Information sharing in the buildings network: before and then after BIM



# The No-BIM Company

- But what about those companies that don't need BIM at all?
  - If you truly believe you are in this type of company, perform your due diligence and ask yourself these questions:
    1. Will we ever collaborate with an outside firm that sends us BIM models?
    2. Will we ever be contractually obligated to provide BIM models?
    3. Will we ever have to create BIM family-type models to those who purchase our products?

*Whether you make factory equipment, produce restaurant benches, or perform landscaping outside a building, the fact is that you may have to work within or around a BIM model at some point, or send data to one. Even if you aren't implementing it, you should be thinking about BIM to some extent if there's a chance you'll interact with it in the future.*

# Manager Chat

## The BIM Lifecycle



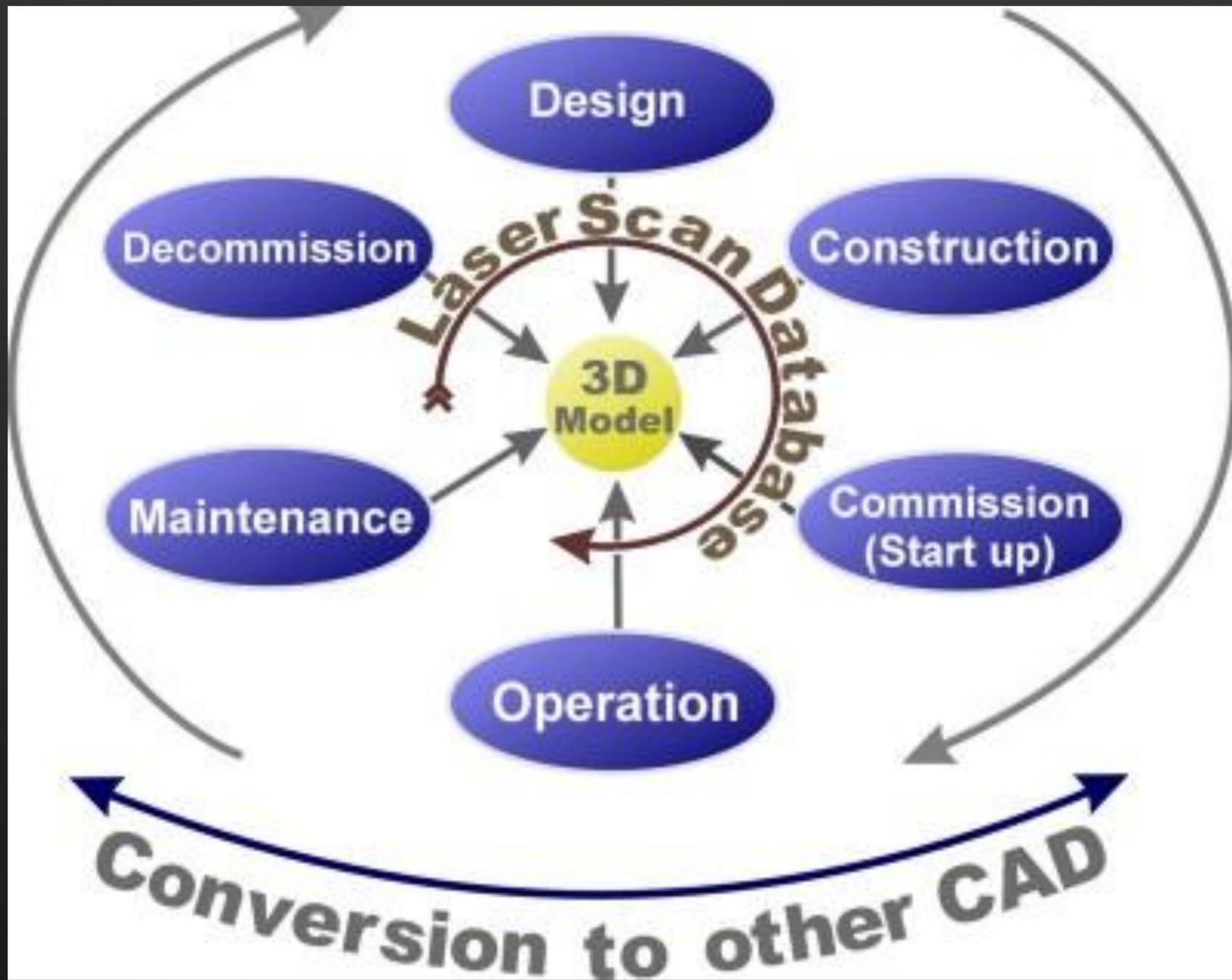
# Who remembers this?



**Identify new technologies and how they are changing the BIM process**

# Laser Scanning





# 3D Scanning

- 3D Scanning is a non-contact, non-destructive technology that digitally captures the shape of physical objects using a line of laser light.
- 3D scanners create “point clouds” of data from the surface of an object. In other words, 3D scanning is a way to capture a physical object’s exact size and shape into the computer world as a digital 3-dimensional representation.
- 3D scanners measure fine details and capture free-form shapes to quickly generate highly accurate point clouds.



# 3D Scanning

- 3D scanning is ideally suited to the measurement and inspection of contoured surfaces and complex geometries which require massive amounts of data for their accurate description and where doing this is impractical with the use of traditional measurement methods or a touch probe.



# 3D Scanning

## *The process*

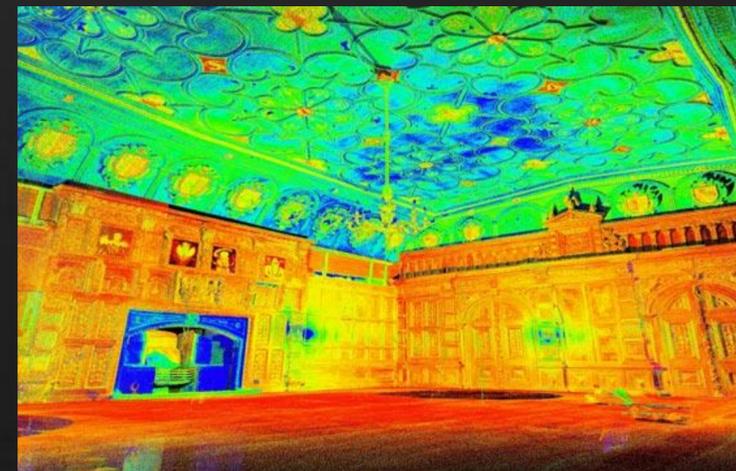


- Data Acquisition via 3D Scanning
- An object that is to be laser scanned is placed on the bed of the digitizer. Specialized software drives the laser probe above the surface of the object.
- The laser probe projects a line of laser light onto the surface while 2 sensor cameras continuously record the changing distance and shape of the laser line in three dimensions (XYZ) as it sweeps along the object.

# 3D Scanning

## *Resulting Data*

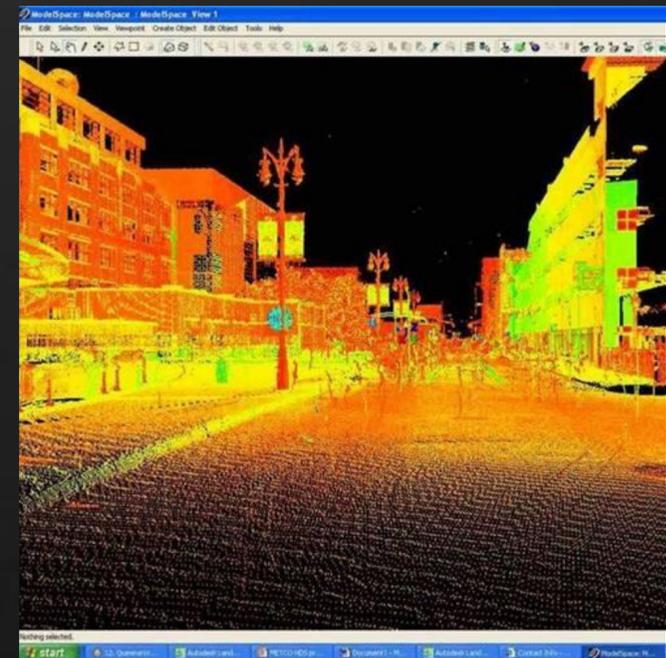
- The shape of the object appears as millions of points called a “point cloud” on the computer monitor as the laser moves around capturing the entire surface shape of the object.
- The process is very fast, gathering up to 750,000 points per second and very precise (to  $\pm.0005$ ”).



# 3D Scanning

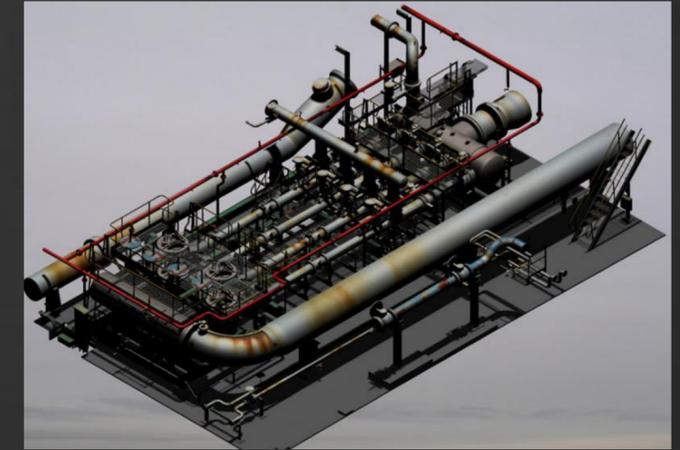
## *Modeling Choice Depends on Application*

- After the huge point cloud data files are created, they are registered and merged into one three-dimensional representation of the object and post-processed with various software packages suitable for a specific application.



# 3D Scanning

## *Point Cloud Data for Inspection*



- If the data is to be used for inspection, the scanned object can be compared to the designer's CAD nominal data.
- The result of this comparison process is delivered in the form of a “color map deviation report,” in PDF format, which pictorially describes the differences between the scan data and the CAD data.

# 3D Scanning

## *CAD Model for Reverse Engineering*

- Laser scanning is the fastest, most accurate, and automated way to acquire 3D digital data for reverse engineering.
- The point cloud data is used to create a 3D CAD model of the part's geometry.
- The CAD model enables the precise reproduction of the scanned object, or the object can be modified in the CAD model to correct imperfections.

# Mobile Devices and Applications



Apps



# Autodesk Mobile Apps



Autodesk // Labs\_

Exploring new approaches to design technology

Home Technology Previews It's Alive in the Lab Discussion About

Autodesk® // Labs\_

//LABS\_ - TRY OUR FREE TECHNOLOGY PREVIEWS.

// BY INDUSTRY // BY PRODUCT // ALPHABETICALLY

**Autodesk® ForceEffect™**  
Analyze design concepts in the field or at the office with a simulation mobile engineering app.  
FREE [App Store](#)

**Autodesk® Fluid FX**  
Manipulate images with special effects: warp, swirl, ignite. Powered by Autodesk Maya FX technology.  
[App Store](#)

**Autodesk® TinkerBox™**  
Create 3D contraptions and solve mechanical riddles with this iPhone/iPod Touch puzzle game.  
[App Store](#) | [App Store \(iPad\)](#)

**Autodesk® Time FX**  
Display time in more than 60 mind-blowing ways—with swirling puffs of smoke and sizzling rings of fire.  
[App Store](#)

**Entertainment**

**Autodesk® 360 Infrastructure Modeler for Mobile**  
View early design infrastructure concepts and project alternatives right from your iPad.  
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**AutoCAD® WS**  
Extend AutoCAD® to your mobile device. Work with AutoCAD drawings. View, edit, and share DWG™ files.  
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**Autodesk® 360 Mobile App**  
Share, view, and comment on 2D and 3D DWG, DWF™, Autodesk® Navisworks®, and Autodesk® Revit® software files directly on your mobile device.  
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**Autodesk® BIM 360 Glue Mobile App**  
Access and intuitively explore multi-disciplinary models online or offline, access all saved views, and review intelligent object properties.  
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**Autodesk® Buzzsaw® Mobile**  
Access project documents from anywhere. View DWF files. Upload project photos directly to the cloud.  
FREE [App Store](#) | [Google Play](#)

**Autodesk® Inventor® Publisher Mobile Viewer**  
Interactively view animated 3D assembly instructions created with Autodesk® Inventor® Publisher software.  
FREE [App Store](#) | [Google Play](#)

**Autodesk® Bluestreak Mobile**  
Track AEC project activities and collaborate on site or at a client meeting.  
[App Store](#)

**Autodesk® 123D® Catch**  
Take photos with your iPhone or iPad and automatically turn them into 3D models.  
[App Store](#)

**Autodesk® 123D® Make Intro**  
Convert 3D models into 2D build plans with animated assembly instructions.  
[App Store](#)

**Autodesk® SketchBook® Mobile**  
Professional-grade painting and drawing app with a full set of sketching tools.  
[App Store](#) | [Google Play](#)

**SketchBook® Express**  
A fun and intuitive drawing app. Use professional-grade tools and brushes to create and save flattened images.  
[App Store](#) | [Google Play](#)

**SketchBook® Pro for iPad™**  
Create everything from quick sketches to high-quality artwork with this professional-grade paint and drawing app for the iPad.  
[App Store](#)

**Pixlr-o-matic™**  
Bring a retro vibe to your photos—try different effects, overlays, and borders with this playful darkroom app.  
[App Store](#) | [Google Play](#)

**Autodesk® 123D® Sculpt**  
Sculpt without getting your hands dirty with this digital sculpting and painting app.  
[App Store](#)

<http://usa.autodesk.com/adsk/servlet/pc/index?siteID=123112&id=16953811>

# Manager Chat

New technologies and how they are changing the BIM process



# Getting the most out of your workforce

# Leadership Myth's

## Management Myth

- That leading and managing are one in the same, they are not.
- Leadership is about influencing people to follow.
- Management focuses on systems and process.



## Knowledge Myth

- People assume that those whom process knowledge and intelligence are leaders, but that is not automatically true.
- IQ doesn't equate to leadership.

## Pioneer Myth

- Misconception that anyone out in front of the crowd is a leader, but being first isn't always the same as leading.

# 3 Basic Rules

Learn how to listen, it is amazing how much you have been missing

- Learn to listen
- Switch on the ability to “learn openly”
- Ask the right questions

Look for passion & curiosity it is always followed by success

- In your work
- In your workplace
- In your employees/co-workers

Play well with others

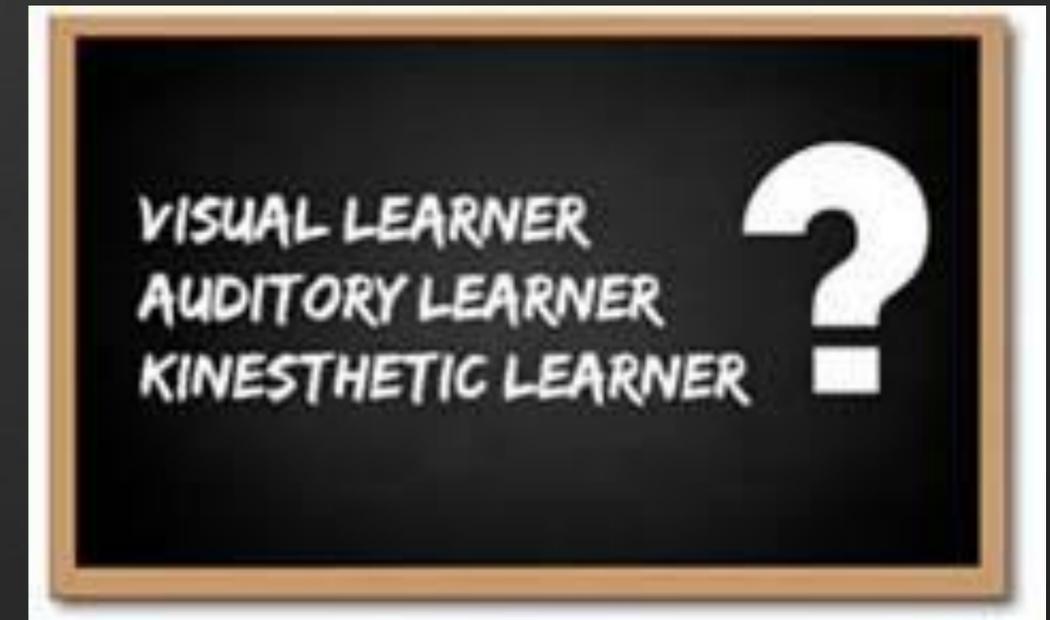
- Be appreciative of your co-workers (say “thank you”)
- Be polite and respectful
- Work as a team
- Share information



# What type of learner are you?

More importantly....

- What type of learner is your boss
- What type of learners are your co-worker(s)



# Brain – Left vs. Right

## Left Brain

Logical  
Sequential  
Rational  
Analytical  
Objective  
Looks at parts



## Right Brain

Random  
Intuitive  
Holistic  
Synthesizing  
Subjective  
Looks at wholes

Most individuals have a distinct preference for one of these styles of thinking.

Left-brain scholastic subjects focus on logical thinking, analysis, and accuracy.

Right-brained subjects, on the other hand, focus on aesthetics, feeling, and creativity

*Nurture Both Sides of your brain*

# Three Types of People in this World

1. Those who learn from others mistakes
2. Those who learn from their own mistakes
3. Those who will never learn



1. Those who love it and become passionate
2. Those who will learn it and be proficient because it is required
3. Those who will never learn

# Resources and links:

- <http://www.thenbs.com/topics/BIM/articles/bimInConstruction.asp>
- <http://www.bim.construction.com/research/>
- <http://finance.yahoo.com/news/bim-symposium-architectureboston-expo-highlights-151100308.html>
- <http://www.bim.construction.com/>
- <http://construction.com/BIM/>
- <http://www.bls.gov/ooh/architecture-and-engineering/drafters.htm>
- [http://bim360field.com/products/field-BIM/?utm\\_campaign=ppc-bing-field-bIM&utm\\_source=ppc](http://bim360field.com/products/field-BIM/?utm_campaign=ppc-bing-field-bIM&utm_source=ppc)
- <http://ascpro.ascweb.org/chair/paper/CPGT182002008.pdf>

# Resources and links:

- [http://caad.msstate.edu/wpmu/acrumpton/files/2010/05/2008IDECProceedings\\_BIM.pdf](http://caad.msstate.edu/wpmu/acrumpton/files/2010/05/2008IDECProceedings_BIM.pdf)
- <http://continuingeducation.construction.com/article.php?L=5&C=207>
- [http://www.amazon.com/BIM-Handbook-Information-Designers-Contractors/dp/0470185287#reader\\_0470185287](http://www.amazon.com/BIM-Handbook-Information-Designers-Contractors/dp/0470185287#reader_0470185287)
- [http://www.laiserin.com/features/bim/newforma\\_bim.pdf](http://www.laiserin.com/features/bim/newforma_bim.pdf)
- <http://allaboutbim.blogspot.com/>
- <http://archrecord.construction.com/practice/projDelivery/0705proj-1.asp>
- [http://www.aecbytes.com/viewpoint/2008/issue\\_35.html](http://www.aecbytes.com/viewpoint/2008/issue_35.html)
- [http://southwest.construction.com/features/archive/0806\\_feature1.asp](http://southwest.construction.com/features/archive/0806_feature1.asp)
- <http://texas.construction.com/opinions/law/archive/2008/0811.asp>

# Resources and links:

- [http://southwest.construction.com/features/archive/0806\\_feature1.asp](http://southwest.construction.com/features/archive/0806_feature1.asp)
- [http://www.aecbytes.com/viewpoint/2008/issue\\_35.html](http://www.aecbytes.com/viewpoint/2008/issue_35.html)
- <http://texas.construction.com/opinions/law/archive/2008/0811.asp>
- <http://texas.construction.com/opinions/law/archive/2009/0903.asp>
- <http://www.cadalyst.com/cad/building-design/the-world-according-bim-part-1-3780>
- <http://draftingindustry.com.au/what-is-bim-to-the-drafting-industry/>

# Open Forum - Question and Answers...





# Annual Beer Bust

South Convention Center

Bayside D

Level 1

# Mahalo for your time....

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