

BIM Presentation to Association Members

BIM – Building Information Modeling is the process of generating and managing building data during its life cycle. Typically it uses three-dimensional, real-time, dynamic building modeling software to increase productivity in building design and construction. The process produces the Building Information Model which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.

IPD – Integrated Project Delivery is a project delivery method that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction.

REVIT – Software to create a BIM model developed and sold by AutoDesk

NAVISWORKS – Software to manipulate and read a BIM model developed and sold by AutoDesk

BENTLEY – Competitor to AutoDesk

ARCHICAD – Competitor to Bentley and AutoDesk

1. Leaving the CAD era behind

- We know very little about the impact that IT has had on the industry over the last 20 years
- We know that we have lagged behind other industries in efficiencies of deploying IT – look at aerospace and automotive sectors and the advances in design and efficiency brought forward through IT
- BIM is a process driven change that goes beyond drafting
- Software is a consumable commodity, just like drafting pencils, pens, erasers of the past, we have to look at it only to the extent that it enables your organization to fulfill its mission.

2. Why BIM?

- Inefficiency and waste has now been benchmarked by the CONSTRUCTION INDUSTRY INSTITUTE (CII) In the US \$1.28 Trillion in construction led to \$600 Billion in waste
- Waste in Construction relative to other industries is exceptional (see figure 2.0)
- Technology is catching up to need to develop robust processes and effect change
- Companies are seeking ways to turn the \$600 Billion waste into profit
- Owners are demanding less E &O
- Owners are demanding tighter delivery schedules
- Procurement methods are changing

3. Managing Culture Change

- Cultural transformation in the construction industry is a greater challenge than any technological transformation to BIM
- Building industry partners will no longer be able to be adversarial, but will have to work as true collaborators. Silos will not work
- For BIM implementation strategies to be effective, software training must be preceded by, or at least accompanied by education. Training teaches people how to do, education teaches people how to think. There is a far greater need for the upfront education in culture change than the technology changeover (see figure 1.0)

4. Business Operations Effected

- 5 major functional areas for all businesses that may be affected
 1. Marketing/Business Development
 2. Human Resources
 3. Finance
 4. Information Technology
 5. Operations

1. Marketing/Business Development

- Upward Information Flow - As procurement methods adopt change to BIM, all supply chain will need to follow suit. Failure to deploy BIM operable information upward will result in loss of work
- Downward Information Flow – As G.C's and suppliers adopt change to BIM and IPD, all supply chain will need to follow suit. Failure to be able to manipulate data (not drawings) will result in a loss of work (see figure 3.0)
- Companies at all levels of supply chain will be required to change to BIM data communication

2. Human Resources

- New jobs will be created to deal with BIM data, suppliers and manufacturers will demand in house created or externally created data rich objects be specified on BIM models which will translate to all participants needing to be able to manipulate objects and intelligent data attached

3. Finance

- BIM is well suited to reducing ambiguity. It allows designers and constructors to construct the building Virtually before it is built in reality. Mistakes can be identified and resolved through 'clash' detection prior to the systems being ordered, and materials on site. (see figure 4.0)

4. Information Technology

- CAD can be considered as the second generation of communicating information regarding a projects components, constructability and code compliance. It replaced a manual method of communicating the necessary information. The components required to communicate the information however remained the same, drawings and specifications working in conjunction with each other. One often overriding the other and a debate at the contractual level to this day
- Information Technology of today allows us to fuse those two entities together ideally creating a unified set of objects to create components to create the structure. This is not unlike the automotive industry or aerospace industry. Opponents of this sea change cite 'prefabrication' as an enemy to the construction industry. It is conceivable to imagine that prefabrication of components is the most significant way to remove the ambiguity.
- Information loss through a cycle of a typical project is estimated at 10% to 20% along the chain of custody for the project. BIM process seeks to eliminate the loss and replace with accurate information as the handoff or better yet collaboration occurs throughout the process. (see figure 5.0)

5. Operations

- Workflow visualization plays a key role in the consulting and construction office of the next decade and goes hand in hand with a functional cross discipline BIM implementation strategy. The strategy must account for varying sizes of projects and complexities.

- The workflow environment over the next decade will look completely different than it does now. Working group silos will be replaced with robust room sized video conferencing and internet communication capabilities in order for real time information to flow to travel between consultants and contractors including subcontractors and suppliers. Although there are concerns about liability and authorship an collaborative environment has shown in large scale projects in the US to reduce the perceived need for defensive documentation. By its nature, a collaborative environment reduces the amount of uncertainty in finding common ground to a potential different understanding of the data being presented.

Published Text Utilized for Reference

Building Information Modeling – A Strategic Implementation Guide – Wiley

RAIC – Building Information Modeling – A Primer - R. Allan Partridge

Resources for Participants:

Canada BIM Council - www.canbim.com

The BIM Shift | CEBERGS.

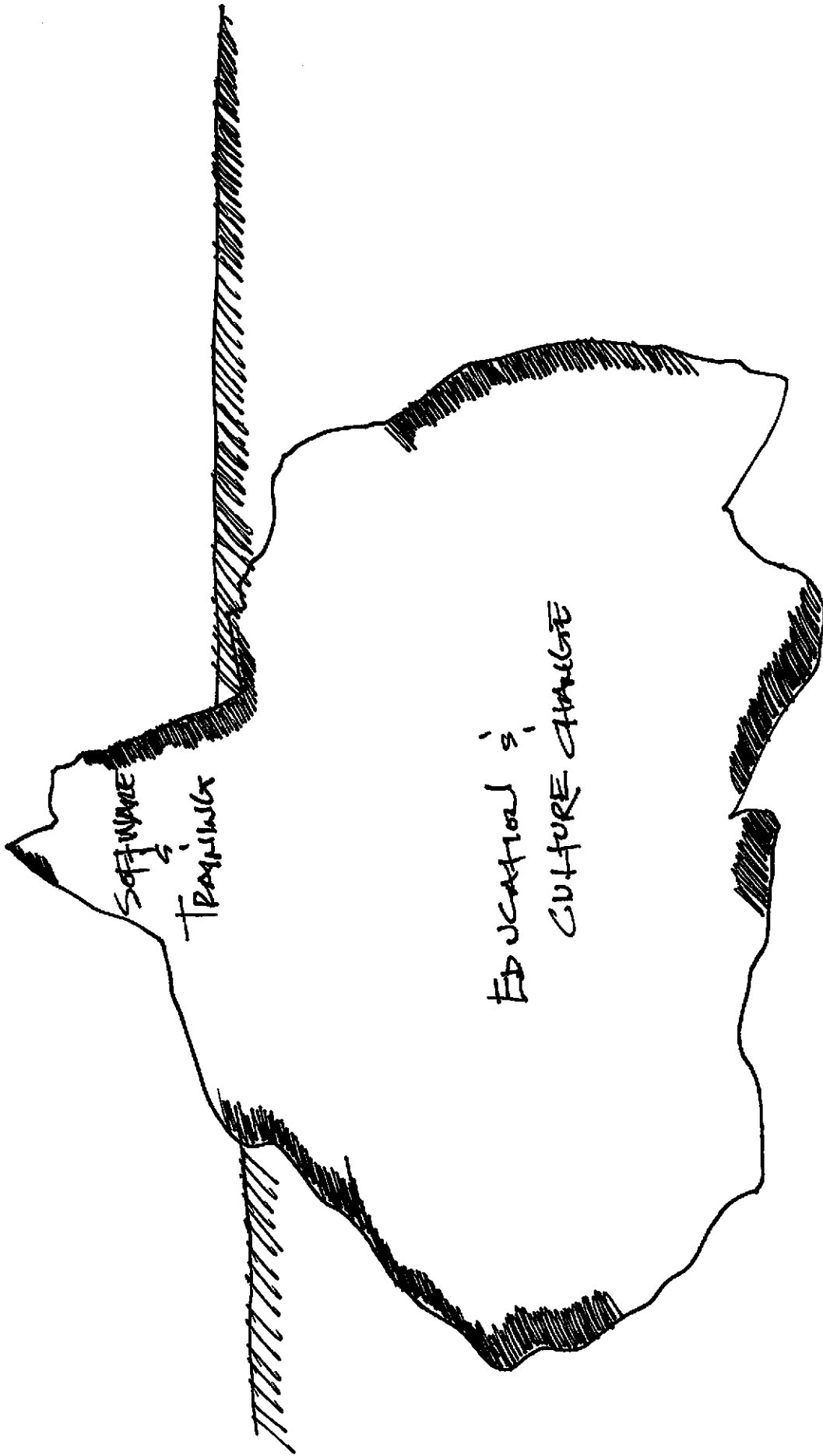
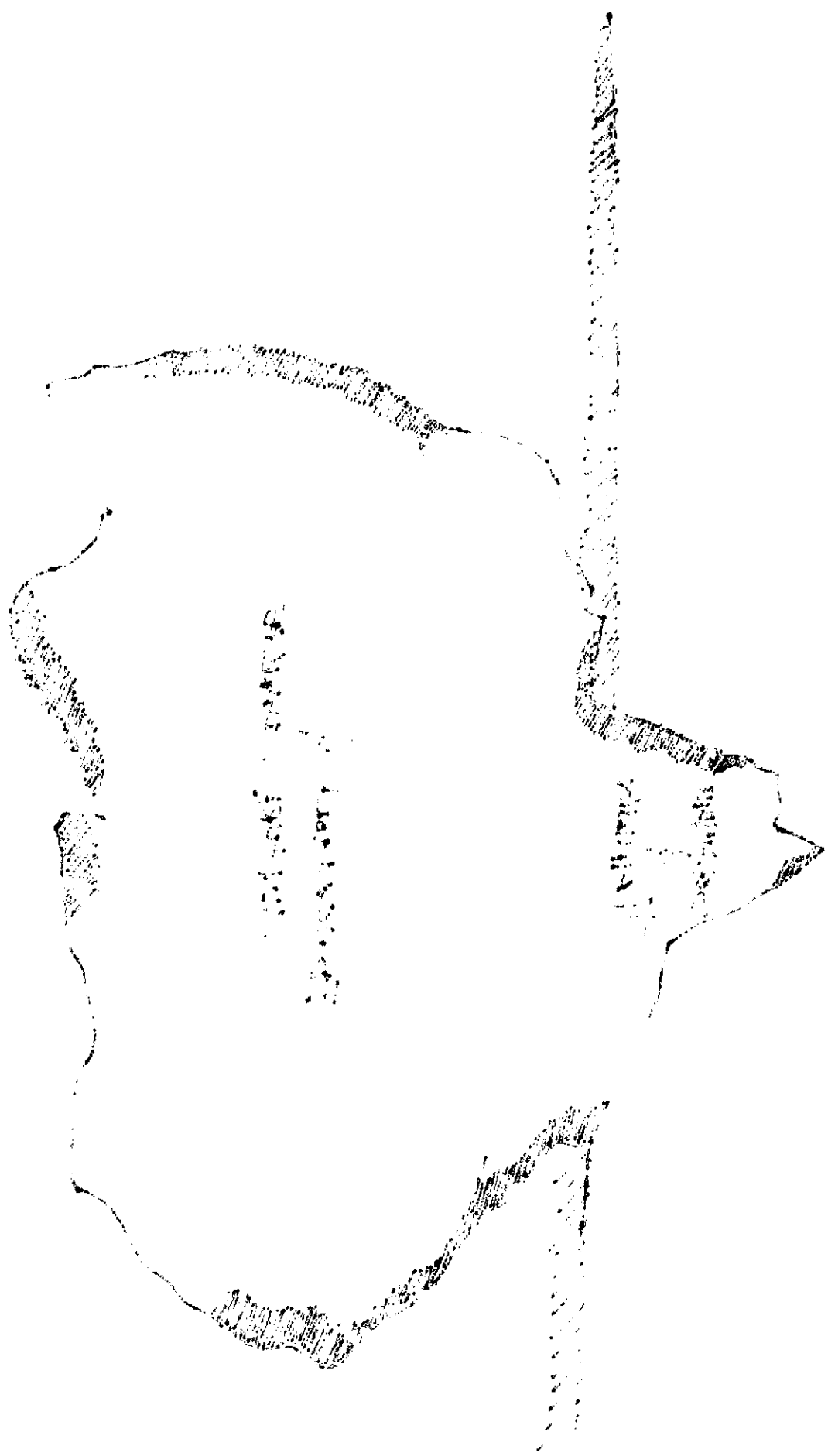


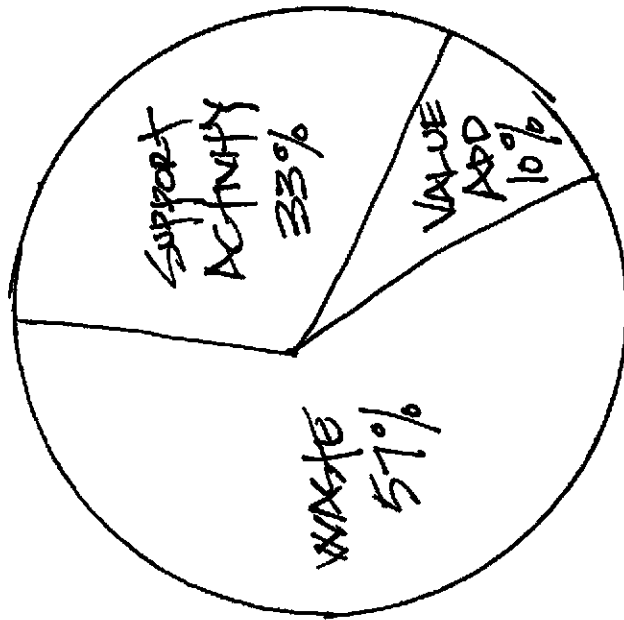
FIGURE 1.0. THE HIDDEN
COSTS & BENEFIT OF BIM.

1000000
1000000
1000000



1000000
1000000
1000000

CONSTRUCTION



MANUFACTURING

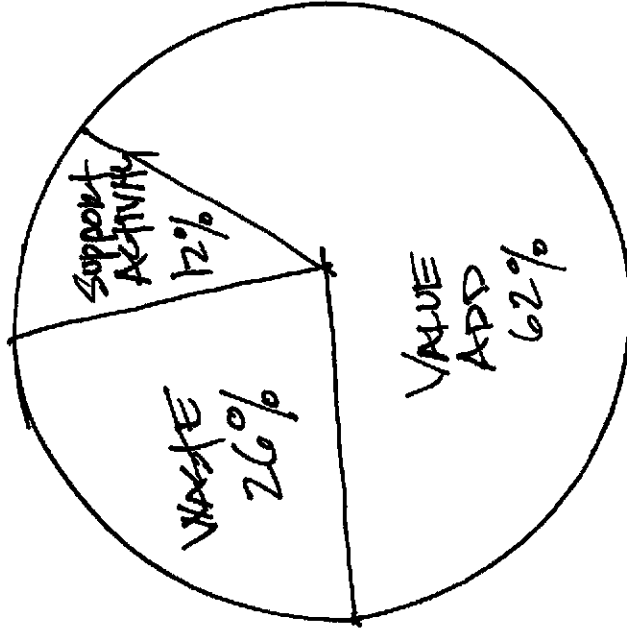


FIGURE 2.0 CONSTRUCTION/
MANUFACTURING WASTE
COMPARISONS PIE CHART
(EASTMAN ET AL., BIM HANDBOOK)

MARKETING | BUSINESS DEVELOPMENT | ADOPTION RATES OF DATA
 PLAN PROCESS DATA

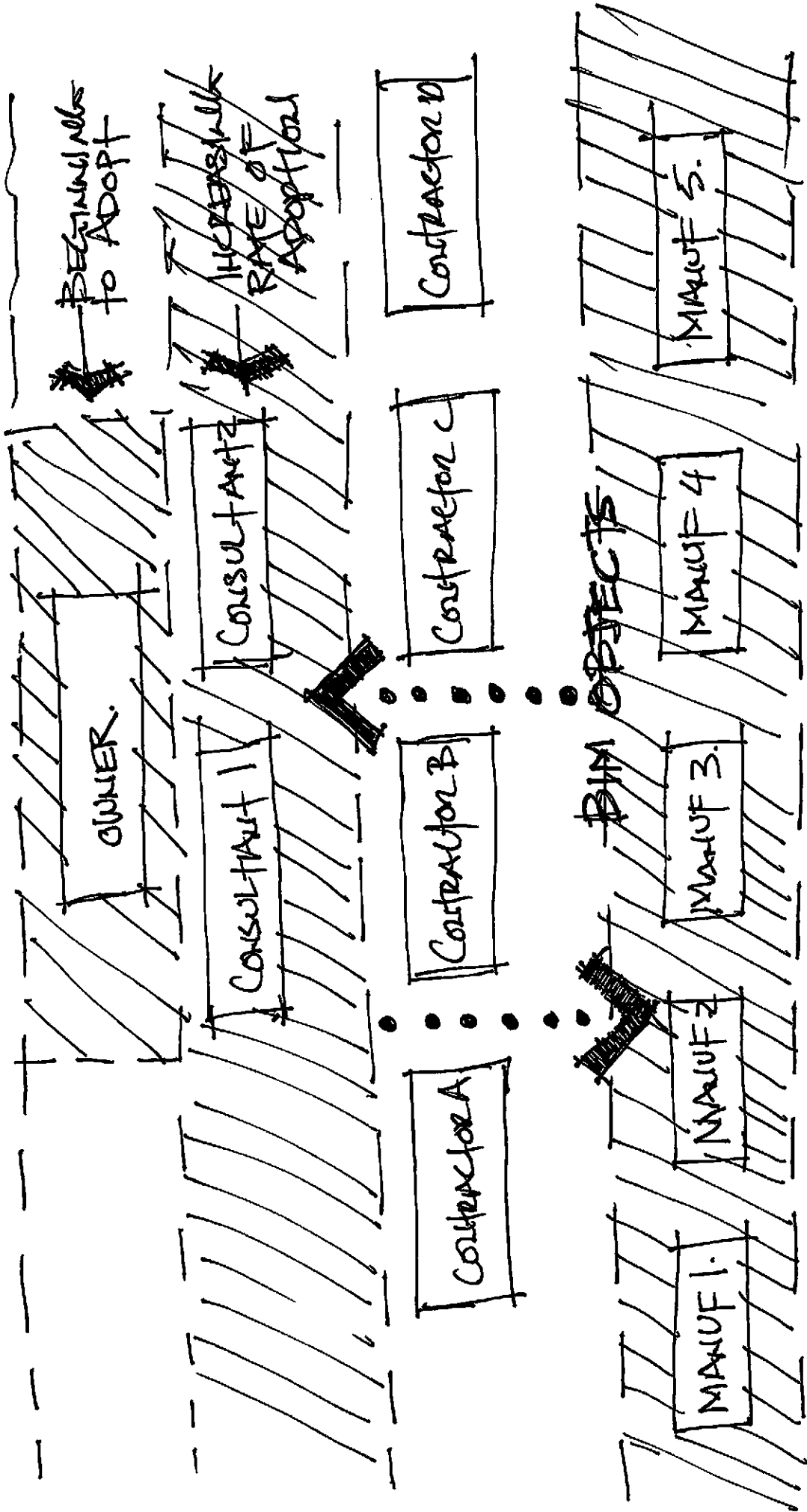
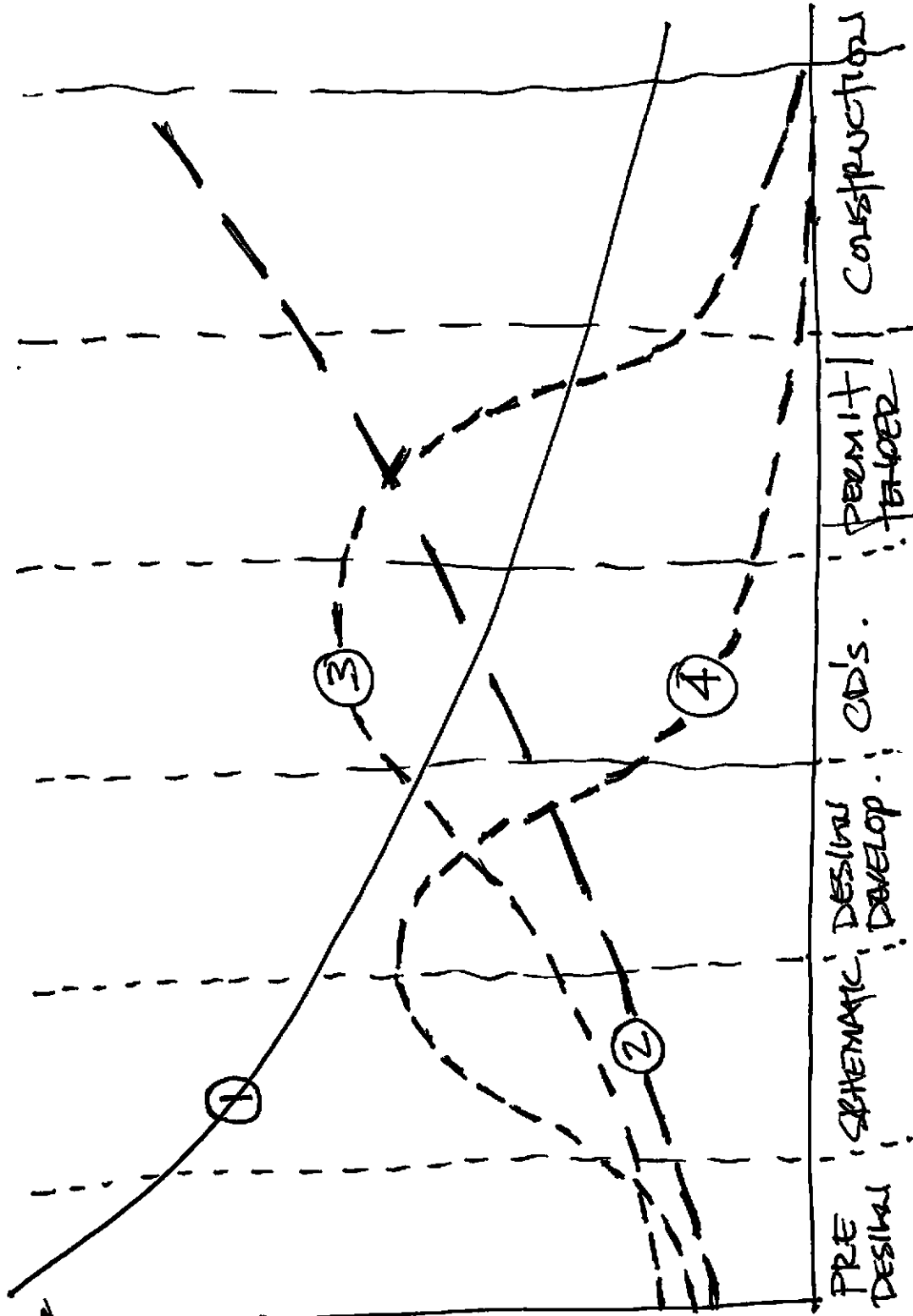


FIGURE 3.0. CHANGE IS
 OCCURRING NOW IN
 COMMUNICATION



- ① Ability to impact cost and functional capabilities
- ② Cost of design changes.
- ③ Traditional design tender/build.
- ④ IPD model.

Figure 4.0 Design Effort and the Cost of Changes.

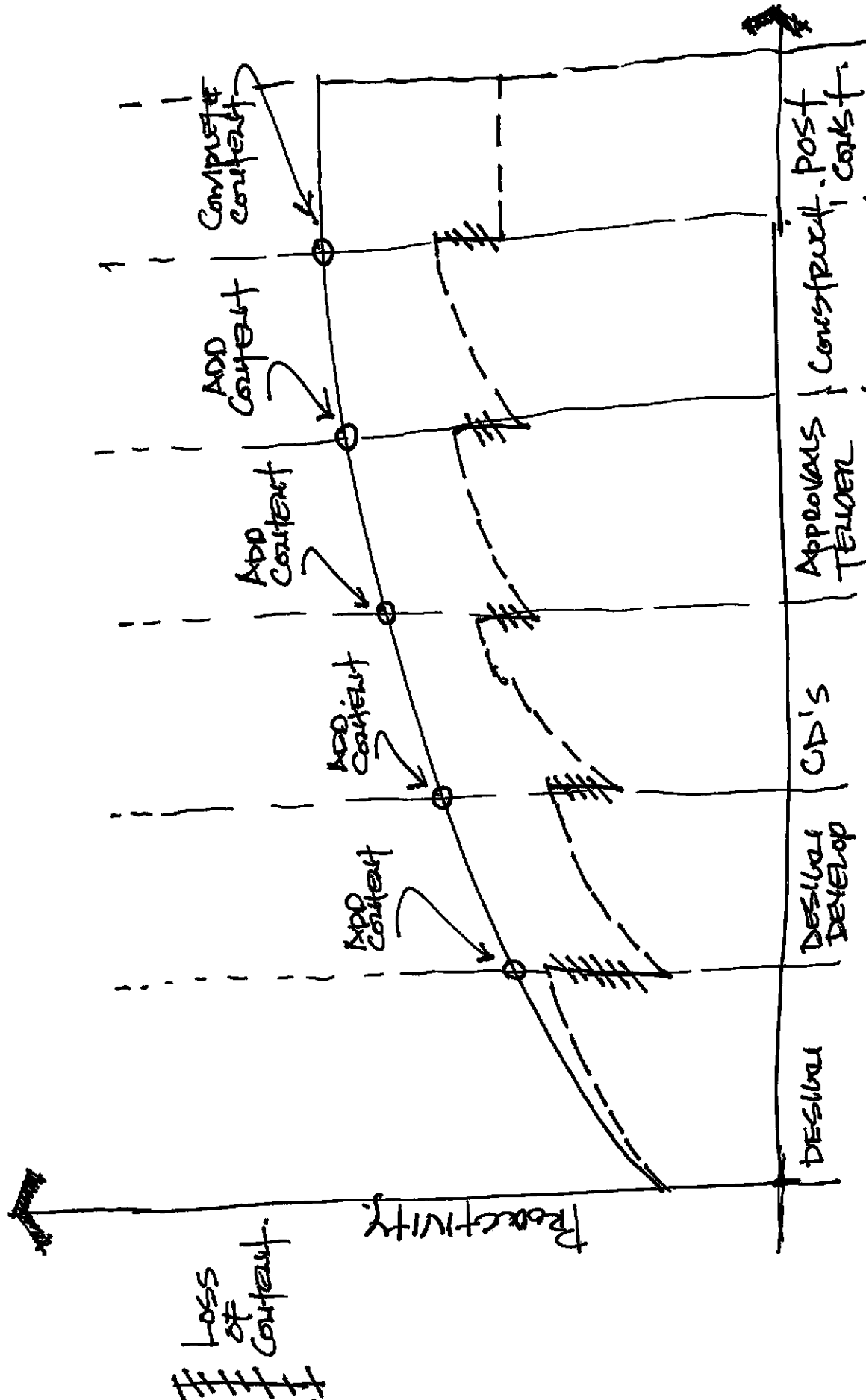


FIGURE 5.0 LOSS OF INFORMATION IN TRADITIONAL PROCESS

Loss of Content