

Project Controls Expo – 13th Oct 2015

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BIM – Building Information Modelling
food for thought - Chef Masterclasses

About the Speaker

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- ❑ Dr. Ing. Mechanical Engineering
- ❑ 1st 15 years: “technical” period
- ❑ remaining 25 + years: “Planning-Project Control- PM – BIM” period
- ❑ Worked in many continents (Middle East, Asia, Africa, Europe)
- ❑ Different industry sectors (Buildings, Airports, Rail, Process)
- ❑ Large and mega projects
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About the Topic

Definition of Building Information Modelling (BIM)

- ❑ BIM is a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, creating and maintaining our assets. (source HM Government BIM Strategy document)
- ❑ In the US BIM is referred to as VDC (Virtual Design and Construction)
- ❑ .. Public sector centrally procured construction projects will be delivered using BIM by 2016...
- ❑ The smartest way of dealing with change
- ❑ The best way to reduce the risk

Most common misconceptions about BIM

- BIM is NOT the 3D Model (produced with a 3D Authoring tools)
- BIM does NOT apply to “Buildings” only (it applies also to Infrastructure)
- The Modelling element of the acronym is not the essence

**the key element and challenge of BIM is
INFORMATION**

Approach adopted

- ❑ As light as possible
- ❑ In general, software agnostic
- ❑ Only the essential terms and Standards will be mentioned
- ❑ Analogies will be mentioned (a comparison that suggests parallels between two different things, explicitly or implicitly)

The two things are BIM – Food

Purpose of this presentation

- Demystify BIM
- Review the BIM elements already familiar to the PM-PC world
- Review the BIM activities performed daily in the PM-PC world
- Review BIM related activities, performed by other disciplines
- Draw your attention to what is still a challenge

BIM documentation and Web sites

Documentation

- ❑ A large amount of material is available on the Internet
 - BIM: approx. 49 Million
 - Building Information Modelling: approx. 40 Mil
 - BIM definition: approx. half Mil

Websites

- ❑ <http://www.bimtaskgroup.org/>
- ❑ <http://www.buildingsmart.org/>

BIM strategy reference documents

 HM Government

22
pages

Industrial strategy: government and industry in partnership



Building Information
Modelling

 HM Government

78
pages

Industrial Strategy: government and industry in partnership



Construction 2025

Main BIM reference Standards



BS 1192
38 pages

PAS 1192-2
68 pages

PAS 1192-3
44 pages

BS 1192-4
58 pages

PAS 1192-5
48 pages

256 pages

Essential BIM terminology

- ❑ **BIM Maturity levels (1,2 &3)**
- ❑ **EIR** – Employer Information Requirements
- ❑ **BEP** – BIM Execution Plan
- ❑ **CDE** – Common Data Environment
- ❑ **DPW** – Digital Plan of Work
- ❑ **COBIE** – Construction Operations Building Information Exchange
- ❑ **IFC** – Industries Foundation Classes
- ❑ **LOD** – Level of Definition (Level of detail – Level of Information)

The analogy



The analogy



The analogy



The analogy



1st element of analogy

200 grams of desire and capability to listen

- ❑ ALL the team members must have the desire and the capability to listen ALL the team members
- ❑ Team members include Client, Designers, Consultants, Contractors, Sub-Contractors AND FM and O&M representatives

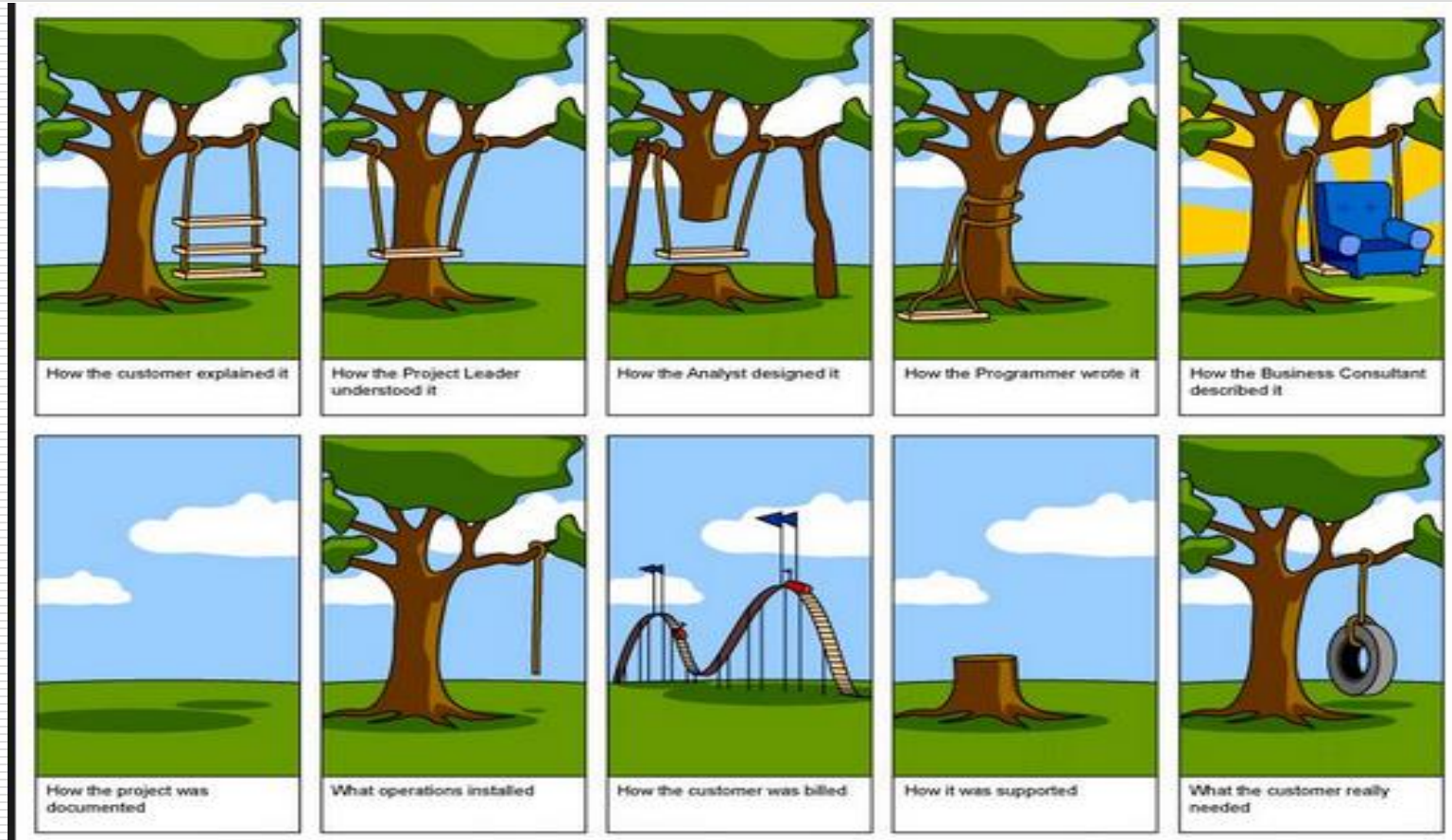
This is what “Requirements Management” is about

- ❑ Not listening may lead to products that do not meet the expectations (Chinese whisper)

200 grams of desire and capability to listen



200 grams of desire and capability to listen



2nd element of analogy

180 grams of specific knowledge

- Scope – Change
- Resource (Quantity and Quality)
- Cost (Estimating-Budgeting-Control)
- Risk and opportunity
- Time (Planning - Scheduling)
- Communication

CapEx

- Facility - O&M

OpEx

Collaboration vs. Integration definition

- ❑ Collaboration is a **data-centric** activity wherein each discipline contributes data information to other disciplines for processing to achieve common objectives
- ❑ Integration is a **knowledge-centric** activity wherein each discipline contributes knowledge in the form of rules, algorithms, and proprietary practices.

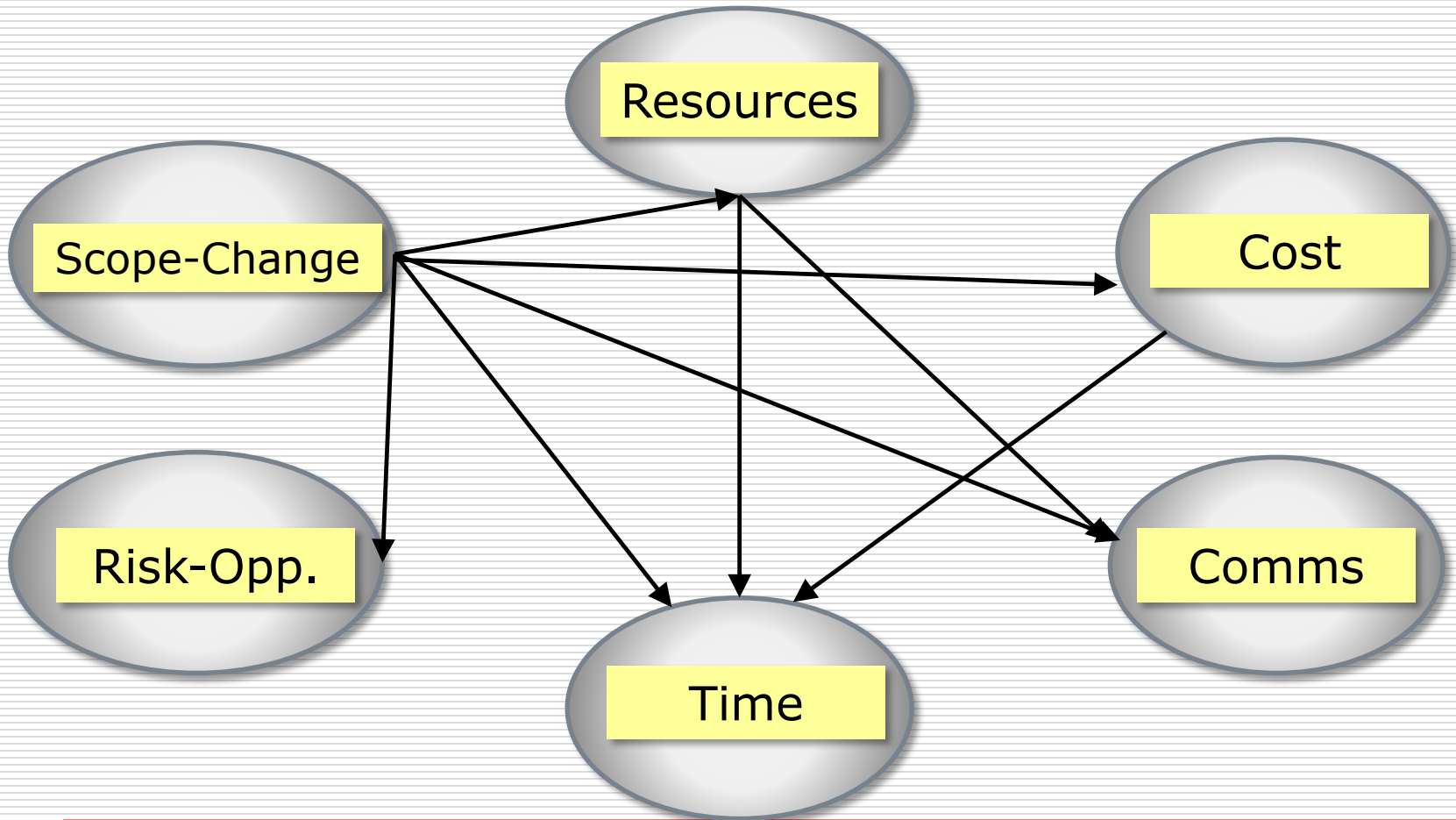
Collaboration vs. Integration

main difference

- ❑ Collaboration requires **identification of a specific project** before work can begin
- ❑ Integration entails the sharing of rules (for humans) , algorithms (for computers), and other proprietary knowledge and practices **before any project is considered**

3rd element of analogy

220 grams of Collaboration



3rd element of analogy

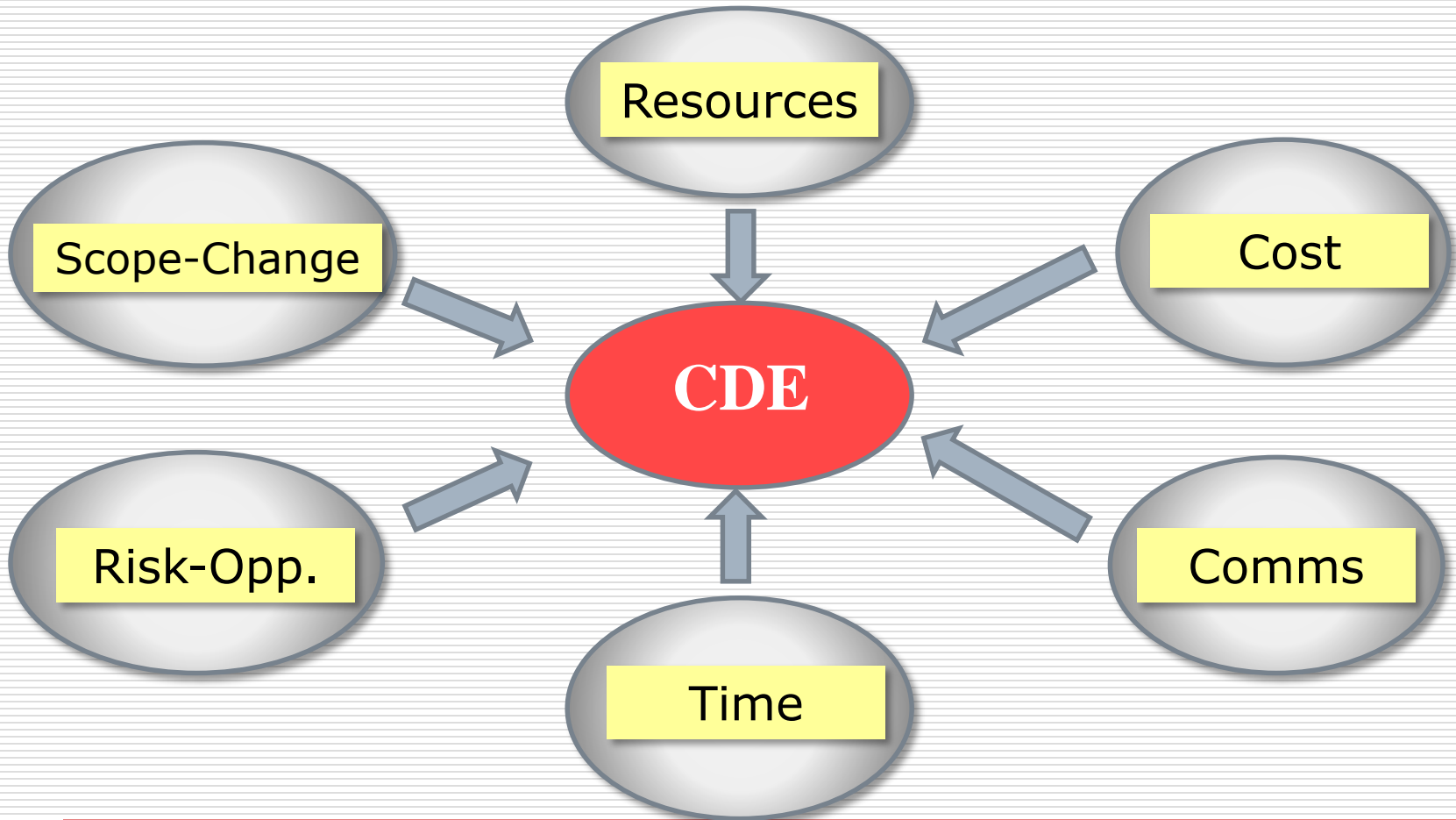
220 grams of Collaboration - example

- ❑ A Structural Engineer designs the structure on the basis of a 30 days old architectural layout
- ❑ The Structural Engineer requires 20 days to produce the structural calculation report
- ❑ After the architectural-structural coordination, the M&E engineer designs the services for that building
- ❑ Etc.

NOT A VERY EFFICIENT WAY OF WORKING

4th element of analogy

250 grams of Integration



4th element of analogy

250 grams of Integration – example

- ❑ The Design team, the Contractor and Sub Contractors meet with the Employer's representative
- ❑ They all discuss the characteristic of what needs to be build with the FM-O&M teams
- ❑ The Information-data exchange format and the Common Language are agreed upon
- ❑ etc.

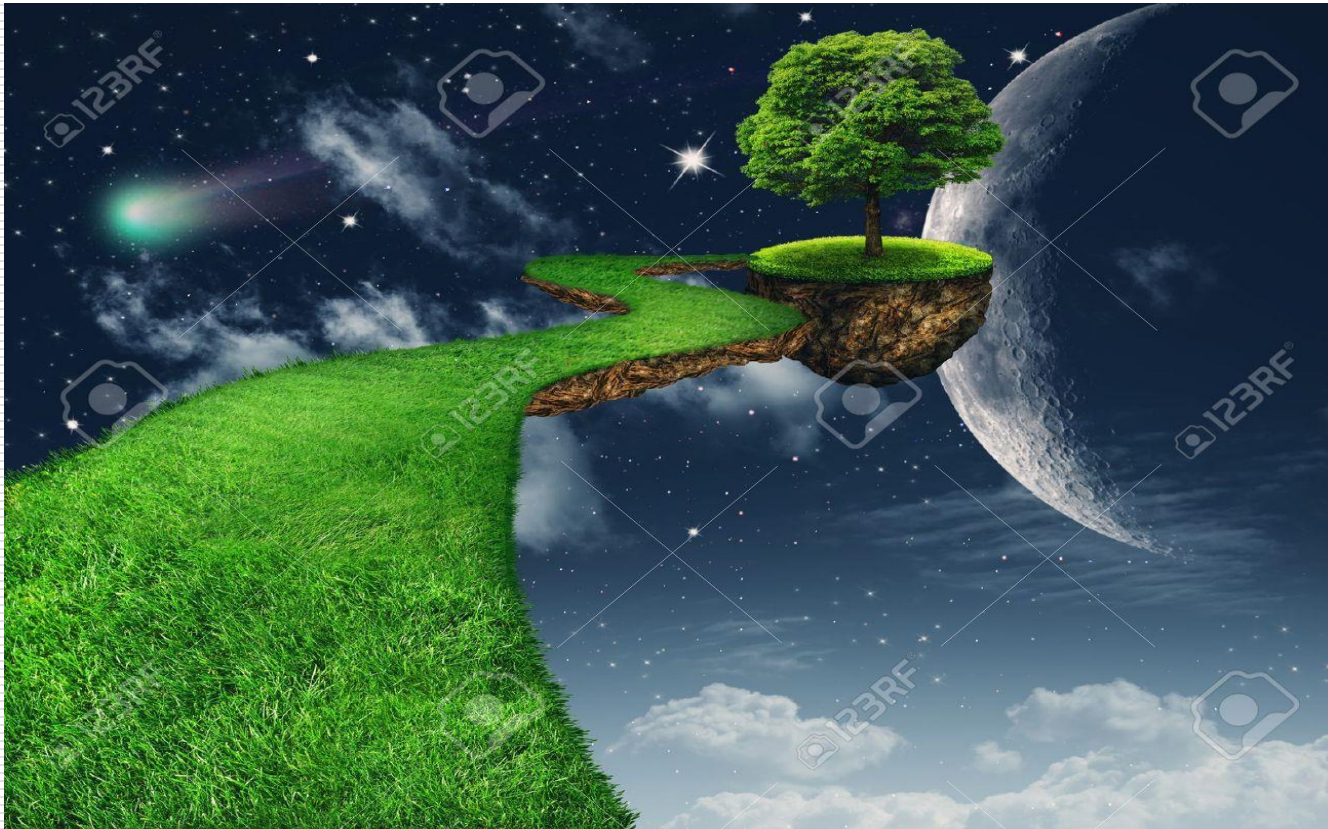
5th element of analogy

300 grams of wisdom



6th element of analogy

250 grams of imagination-fantasy



Final considerations

Challenges

- ❑ The technology underpinning BIM is not fully mature, especially in terms of Integration and ease of use.
- ❑ BIM will grow continuously (we will have to continue working on it)
- ❑ Standards, regulations, contractual clauses play a key role in the implementation of a BIM solution.
- ❑ The human factor is key: some investment must be made in this area (technical and behavioural)

Final considerations

The good news

- BIM-Food preparation and PM/PC have a lot in common (i.e. BIM is not rocket science)
- The interest in BIM and the associated cultural change are in front of our eyes
- Work is underway to introduce a “pain and gain share” type contractual culture
- BIM is here to stay and will improve our way of working

Suggestions

- Dedicate some time to becoming familiar with the BIM documentation
- Enhance your communication capabilities (passive and active)
- Endeavour to understand the "big picture" at all times
- Work towards "the BIM way" because it is greater fun than working in isolation

The ingredients of a BIM Master Chef

- 200 grams of desire and capability to listen
- 180 grams of specific knowledge
- 220 grams of Collaboration
- 220 grams of Integration
- 300 grams of wisdom
- 250 grams of imagination-fantasy

Conclusions

Presentation's intended purposes:

- Demystified BIM
- The PM-PC world is familiar with the majority of the BIM elements
- Many BIM related activities are already performed daily by PM-PC professionals
- Other “disciplines” (e.g. Lean Construction and System Integration) are dealing with BIM related topics (**The BIM community is growing**)
- We must be aware: there are still some unresolved challenges

The End

Enjoy yourBIM!