



**MICROBE**

Co-funded by the  
Erasmus+ Programme  
of the European Union



# **IO1/A5: DEVELOPMENT OF THE MICROBE PERSONALIZED MOOCS CONTENT AND TEACHING MATERIALS.**

**TRAINING OF TEACHING STAFF AND PUBLIC EMPLOYEES 17.01.2022**

**Partner Institution P4 Tallinn University of Technology, Estonia**

**Margarita Ratšinski**

**Project Number 2020-1-LT01-KA203-078100**

# TODAY's AGENDA

09:15 – 11:55	TalTech Training Session
11:55 – 13:00	Break
13:00 – 15:20	University of Granada Training Session
15:25 – 16:00	Q&A Session

- **The humans' behavior on influence of coronavirus and negative emotions in a built environment: a study of University of Granada.**
- **The University of Granada and COVID-19: A safe and innovative university.**
- **Detection of people's acceptance of the people's vaccination plan in Spain based on measurable characteristics.**

# TALTECH AGENDA

5-10 min	<b>Our Training Setup</b>
<b>09:20 – 10:05</b>	<b>Our Past: Retrospective View on Urban and Architectural Developments to Minimize Risks of Infectious Diseases</b>
15 min	Lecture
15 min	Workshop: working in small groups (in Zoom escape rooms) on changes to urban and architectural approaches with examples
15 min	Group leader reports on the finding based on the discussion among colleagues
<b>10:10 – 10:55</b>	<b>Our Present. Innovation in the Construction Management and Technology</b>
15 min	Discussion continues
30 min	Lecture + preparation for a workshop (in Zoom escape rooms)
<b>11:10 – 11:55</b>	<b>Our Future. Incorporating Antivirus-built Environment Strategies into Construction Project Management and Technology</b>
15 min	Workshop: working in small groups (in Zoom escape rooms) on post-pandemic design and planning strategies examples
15 min	Group leader reports on the finding based on the discussion among colleagues
15 min	Final discussion on the right design and planning strategies that could help to position our built environment in the post-pandemic era

# MICROBE project

- Minimizing the influence of coronavirus in a built environment (MICROBE) is a project co-founded by Erasmus+ Programme of the European union.
- **One of the main objectives of MICROBE project:**  
To upgrade curricula of MSc by adding **3 new** multidisciplinary personalized, recognized and certificated MOOC modules on consumer behavior change related to MICROBE education, to enhance the quality and relevance of education in participating universities to global issues.

# What is your specialization in the construction industry?

- Project manager in a company
- Construction site manager
- Structural design engineer in a company
- Construction site engineer
- Manufacturing engineer
- Architect in a company
- Architect in a local government
- Design consultant
- Building consultant
- Quantity estimator
- Owner representative
- Researcher (university)
- Local government administrator
- None of the above

# OUR TRAINING SETUP

# SELF-INTRODUCTION

SCIENCE

**TAL  
TECH**



**Berkeley**  
UNIVERSITY OF CALIFORNIA

**KIT**  
Karlsruher Institut für Technologie

PRACTICE



EESTI TIMMITUD Ehituse Tugirühm  
**ETET**

**TAL  
TECH**

COLLAB

**TAL  
TECH**



TALLINNA  
TEHNIKAKÕRGKOOI



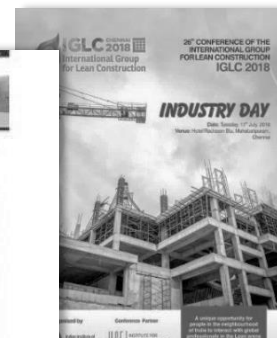
**Riigi Kinnisvara**

**EHITUSKESKUS**

**Äripäev**

**usesoft**

PUBLICATIONS



# MOOC MODULE AIMS

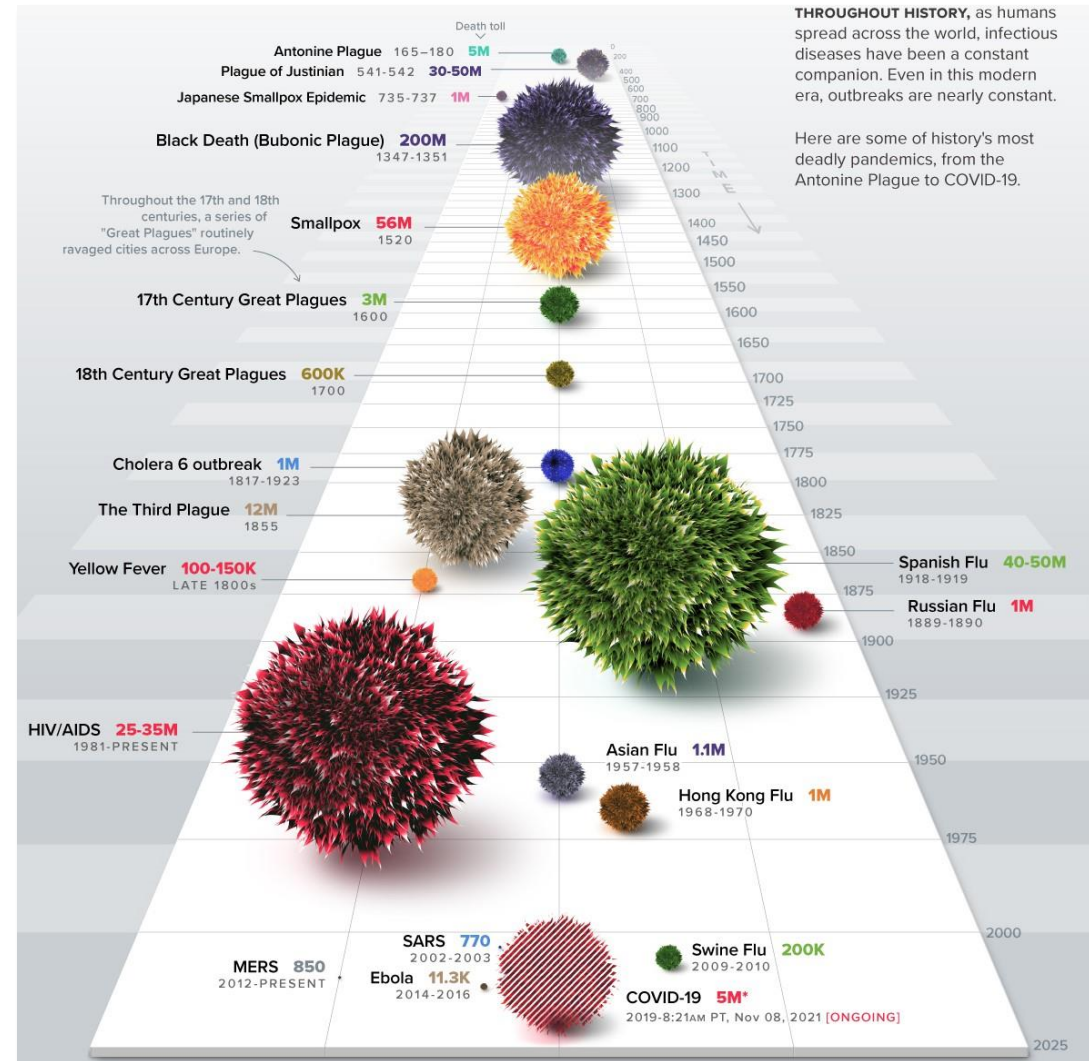
- Incorporating antivirus-built environment strategies into construction project management and technology courses.
- Aim is to propose a vision about the future of the antivirus-built environment.
- Using interdisciplinary approach: construction technology, digital transformation, psychology, medicine, history, chemical engineering, material engineering, IT.



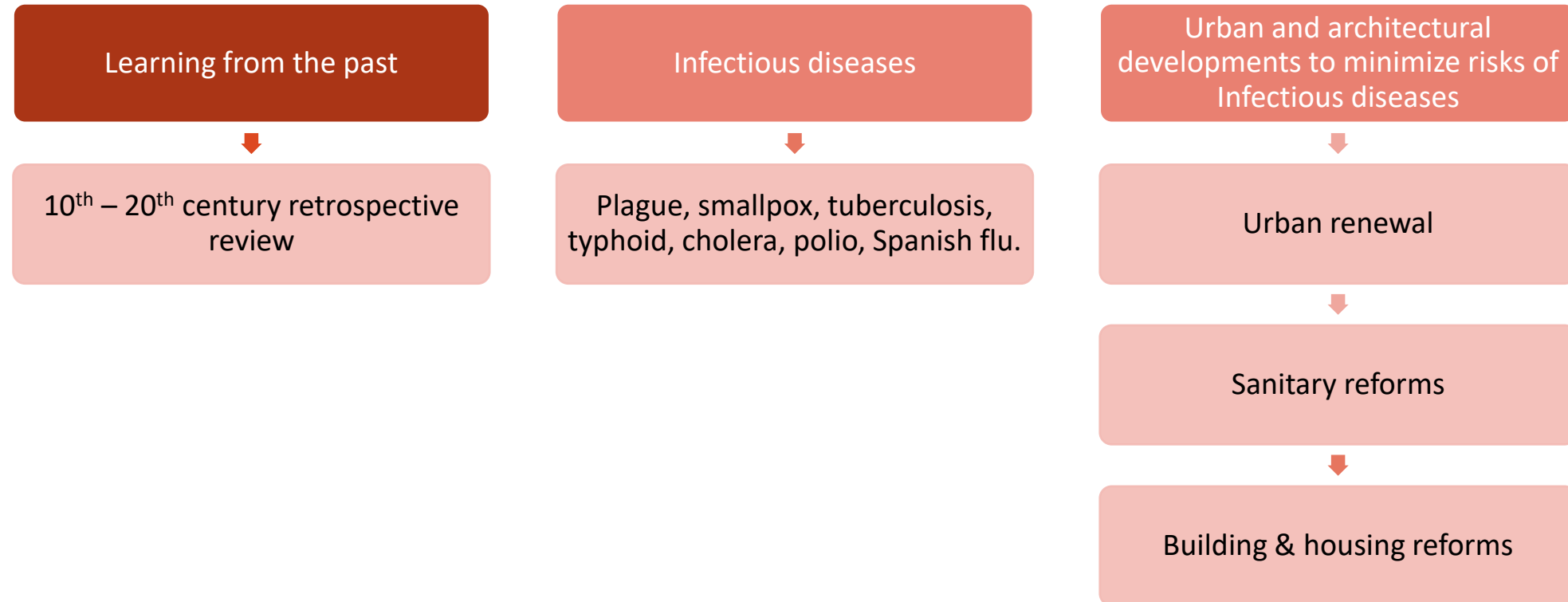
# OUR PAST

Retrospective View on Urban and Architectural Developments to Minimize  
Risks of Infectious Diseases

# OUR PAST



# OUR PAST



# OUR PAST. ANTICIPATED RESULTS

- Antivirus-enabled paradigm.
- Post-pandemic design and planning strategies must reflect this change.
- The right design and planning strategies now could help to position our built environment in the post-pandemic era.

# OUR DISCUSSION SESSION

- I will prepare breakout rooms; you will be invented.
- On your screen you will see an invitation to join a group, please accept, and remember the number of your group.
- For those who are together physically, no breakout room is needed.
  - Please use a paper and a pen to write down your ideas and keywords.
- When you are in the breakout room, you will have 15 min to discuss a question.

# OUR PAST. DISCUSSION SESSION

## Learning from the past.

Discuss with your groupmates, what impact did infectious diseases have on architecture and urban planning. The examples of diseases is not limited to (propose your example): tuberculosis, typhoid, polio, Spanish flu.

1. Choose a presenter of your group (he/she will report the ideas).
2. Write down the name of the presenter.
3. Discuss.
4. Keyword or main ideas should be written in the end of the form.
5. Submit the form!
7. You should send at least one filled form from your group.
6. You have 15 minutes.



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# OUR PRESENT

Innovation in the Construction Management and Technology



# OUR PRESENT

Construction  
sector  
in Europe



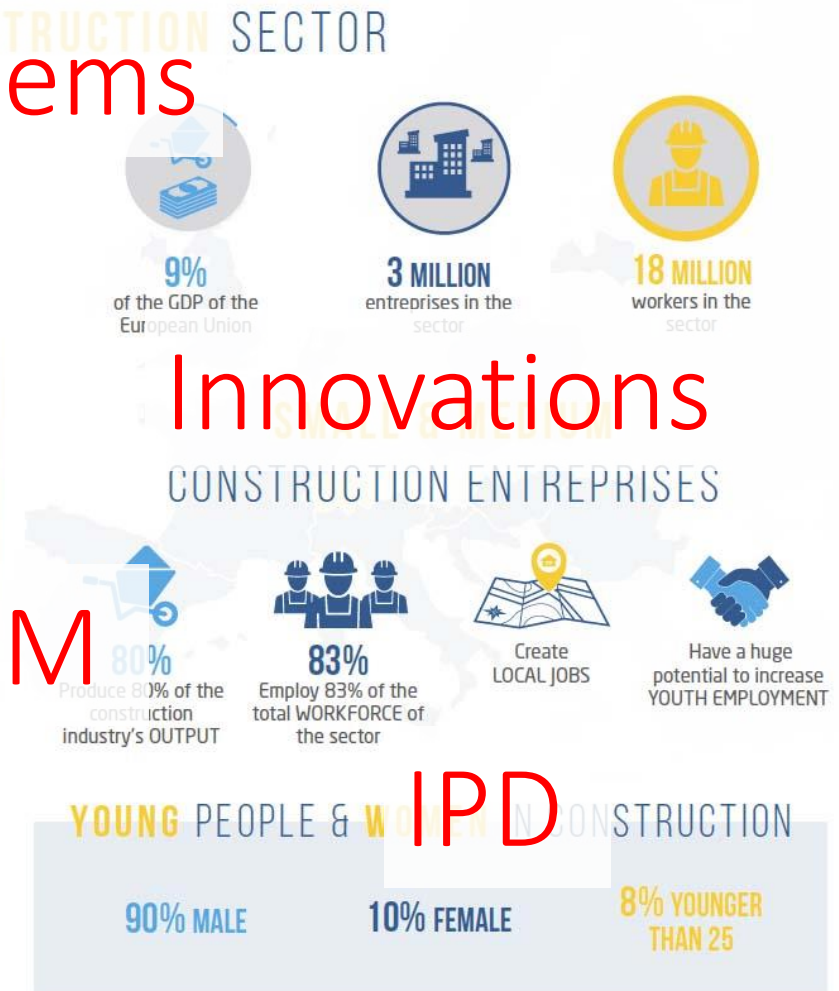
Problems

BIM

LEAN

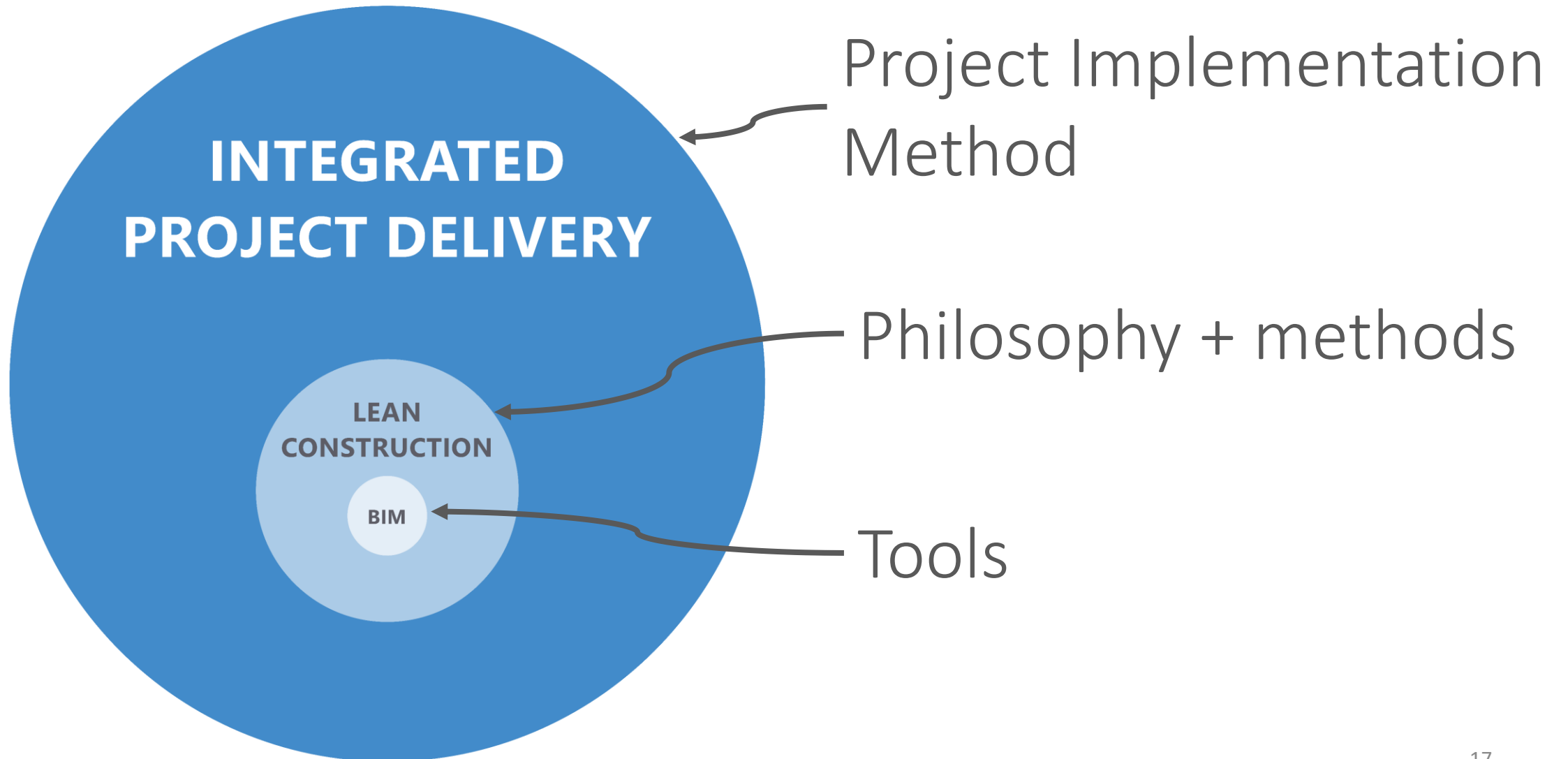
Innovations

IPD





# OUR PRESENT



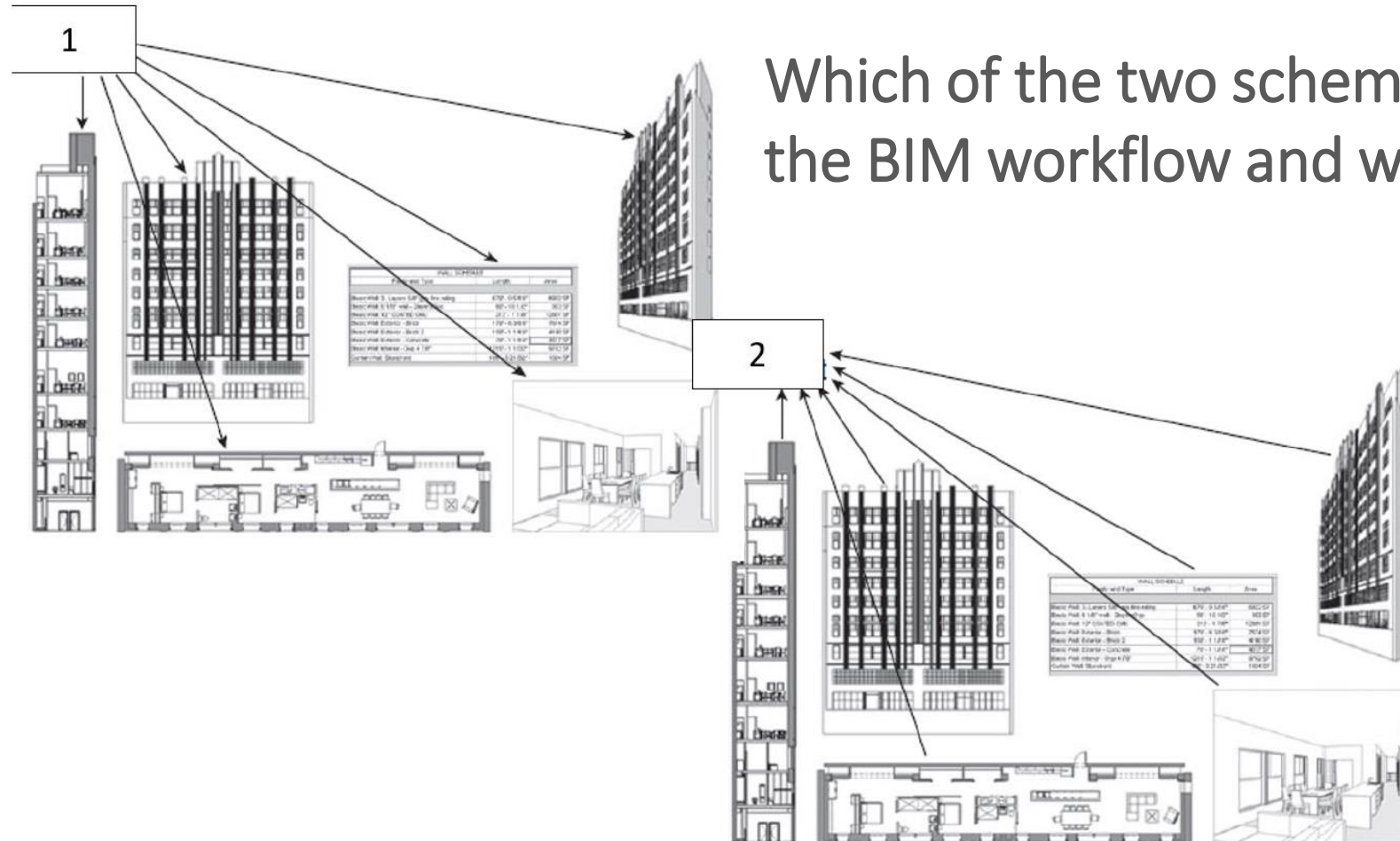
# OUR PRESENT. BIM

What is **BIM**?

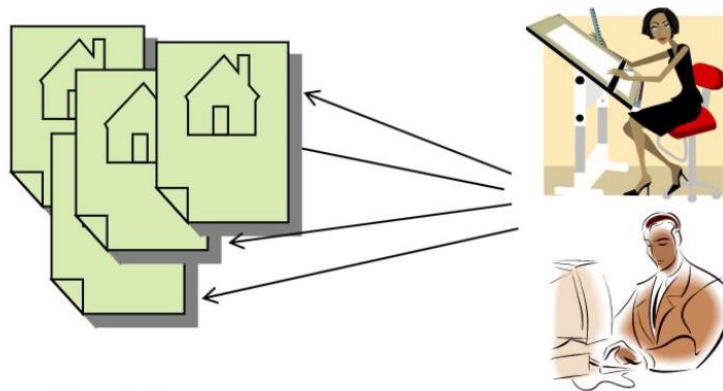
# OUR PRESENT. BIM



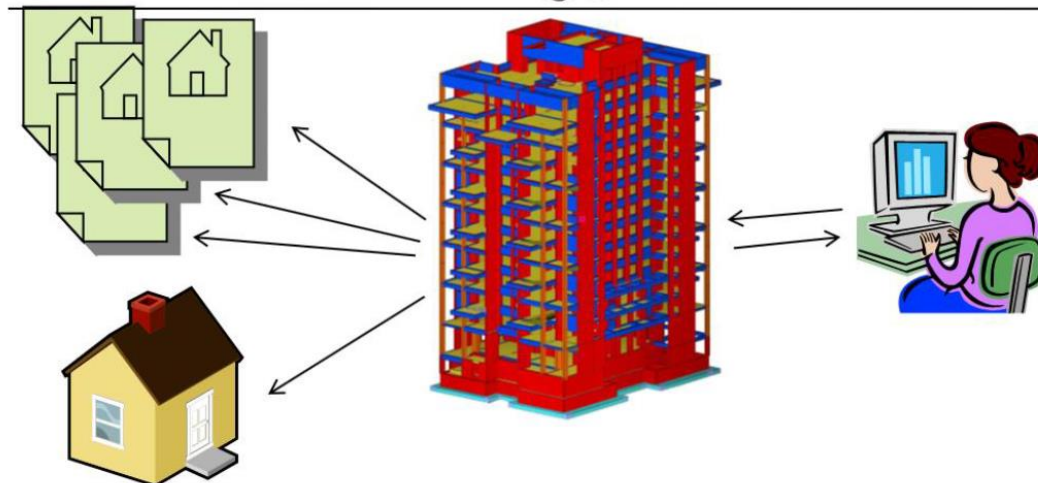
# OUR PRESENT. BIM vs CAD



# OUR PRESENT. MODELLING OR CREATING DRAWINGS



Drawings (created manually or using a computer)



Infomodeling (computerized)



# OUR PRESENT. BIM ADVANTAGES. VISUALISATION



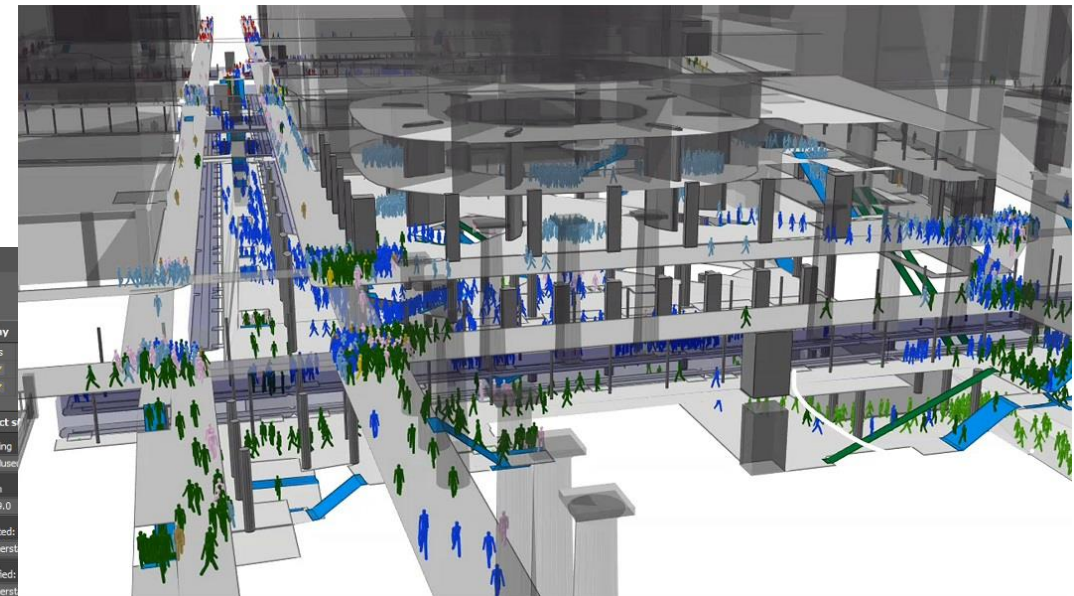
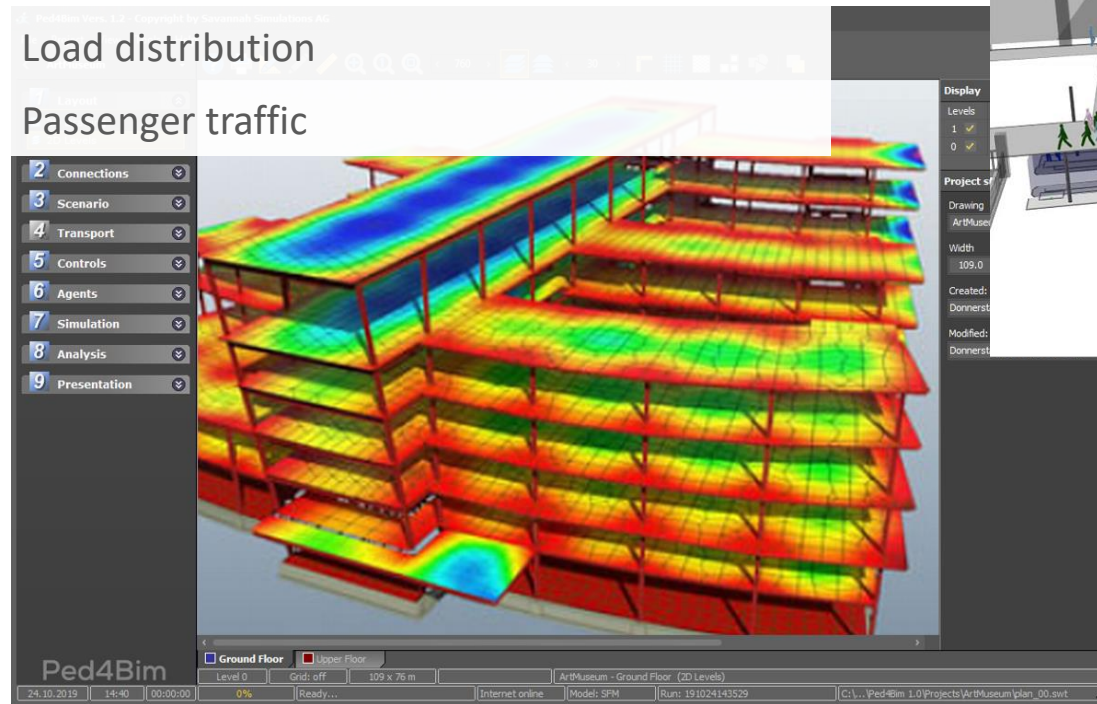
# OUR PRESENT. BIM ADVANTAGES. PRE-DESIGN PHASE





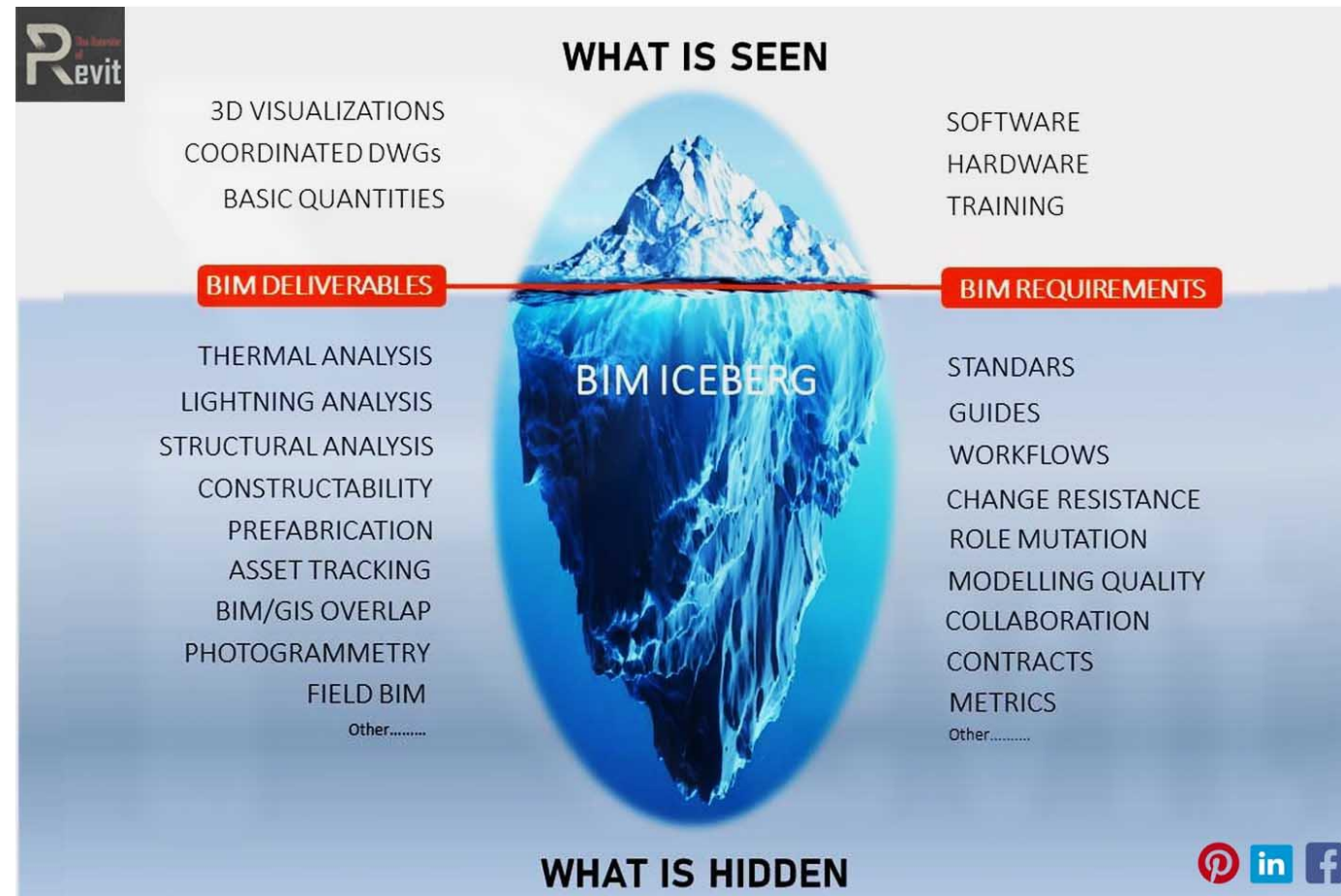
# OUR PRESENT. BIM ADVANTAGES. SIMULATIONS

- Energy
- Air flow rate, need for cooling/heating
- Illumination
- Acoustics
- Load distribution
- Passenger traffic





# OUR PRESENT. BIM. ICEBERG



# OUR PRESENT. CONSTRUCTION PRODUCTIVITY

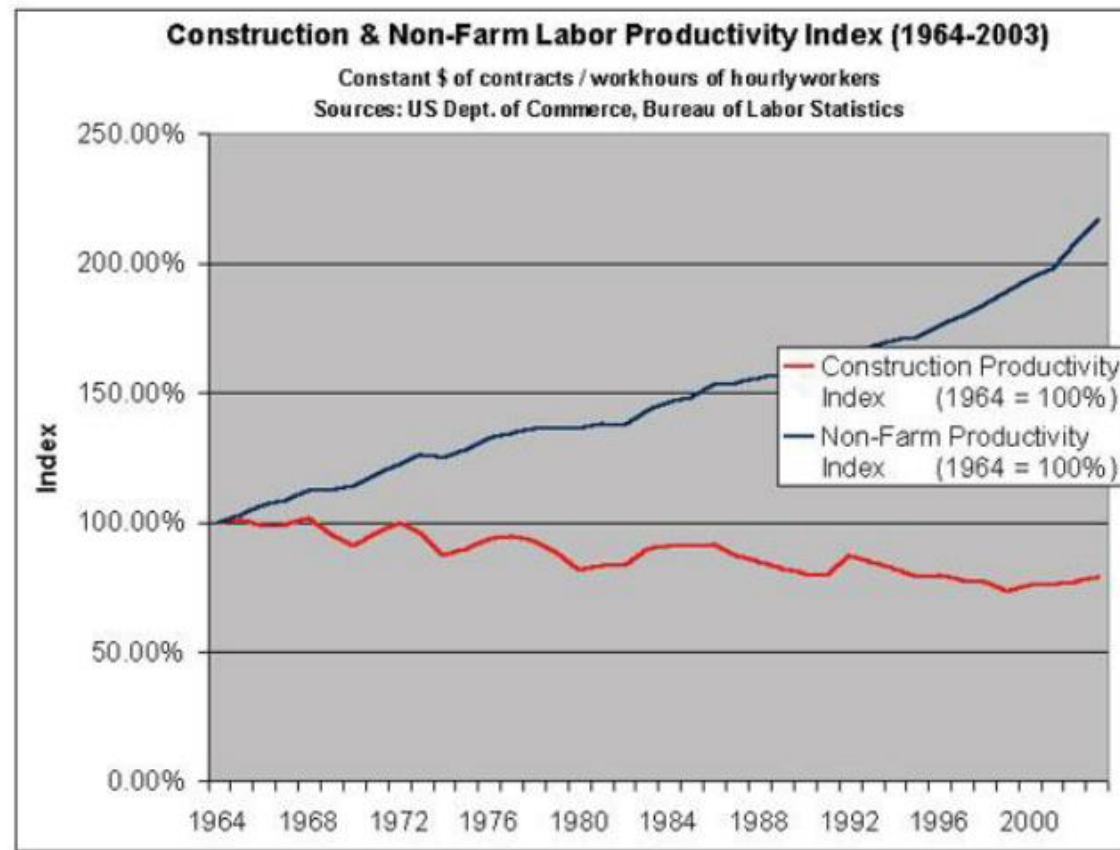


Figure 1: Labor productivity index for US construction industry and all non-farm industries from 1964 through 2003, National Institute of Building Science (NIBS) 2007

# OUR PRESENT. FRESH NEWS

**70%**

OVER SCHEDULE AND  
BUDGET!

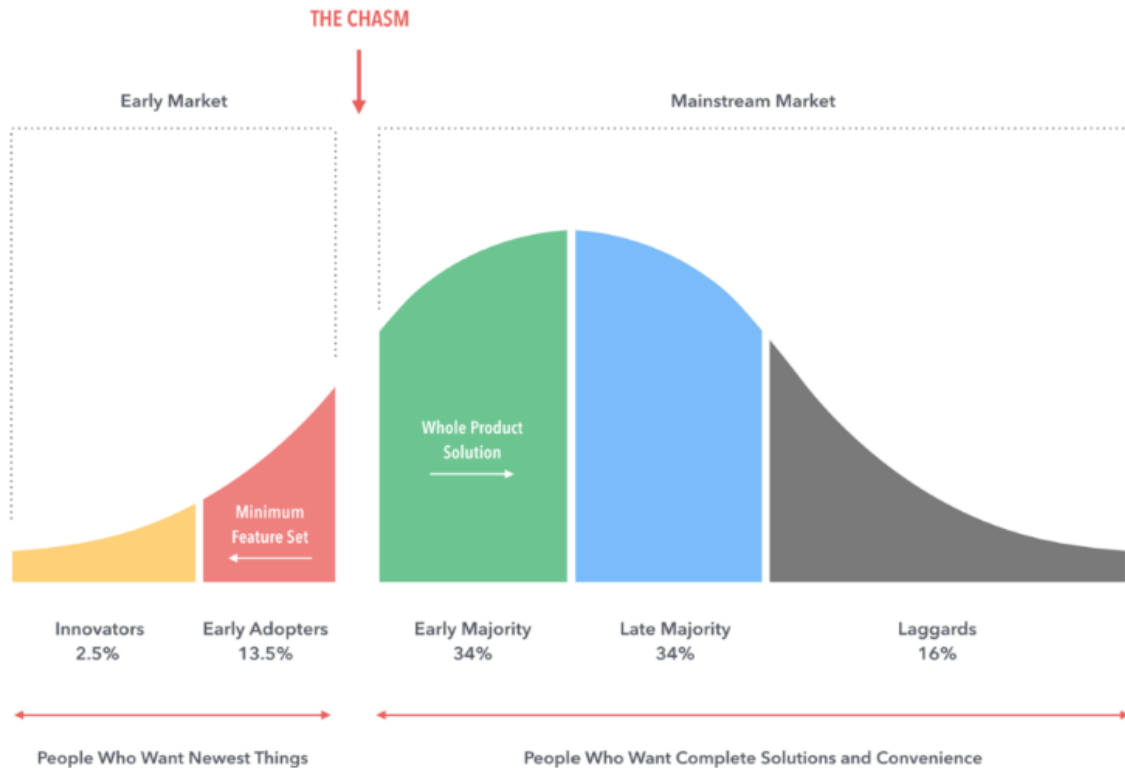
**60%**

PROCESS IS WASTE!

**50***years*

LAGGING!

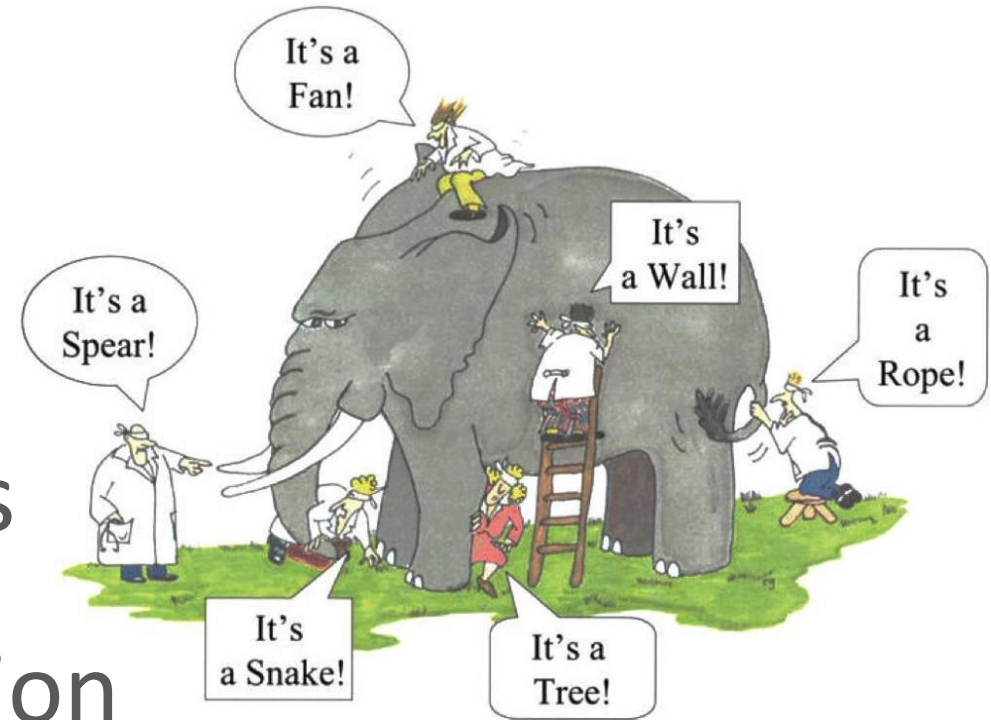
# Which innovation adoption segment do you belong to?



Innovators  
Early adopters  
Early majority  
Late majority  
Laggards

# OUR PRESENT. BIM

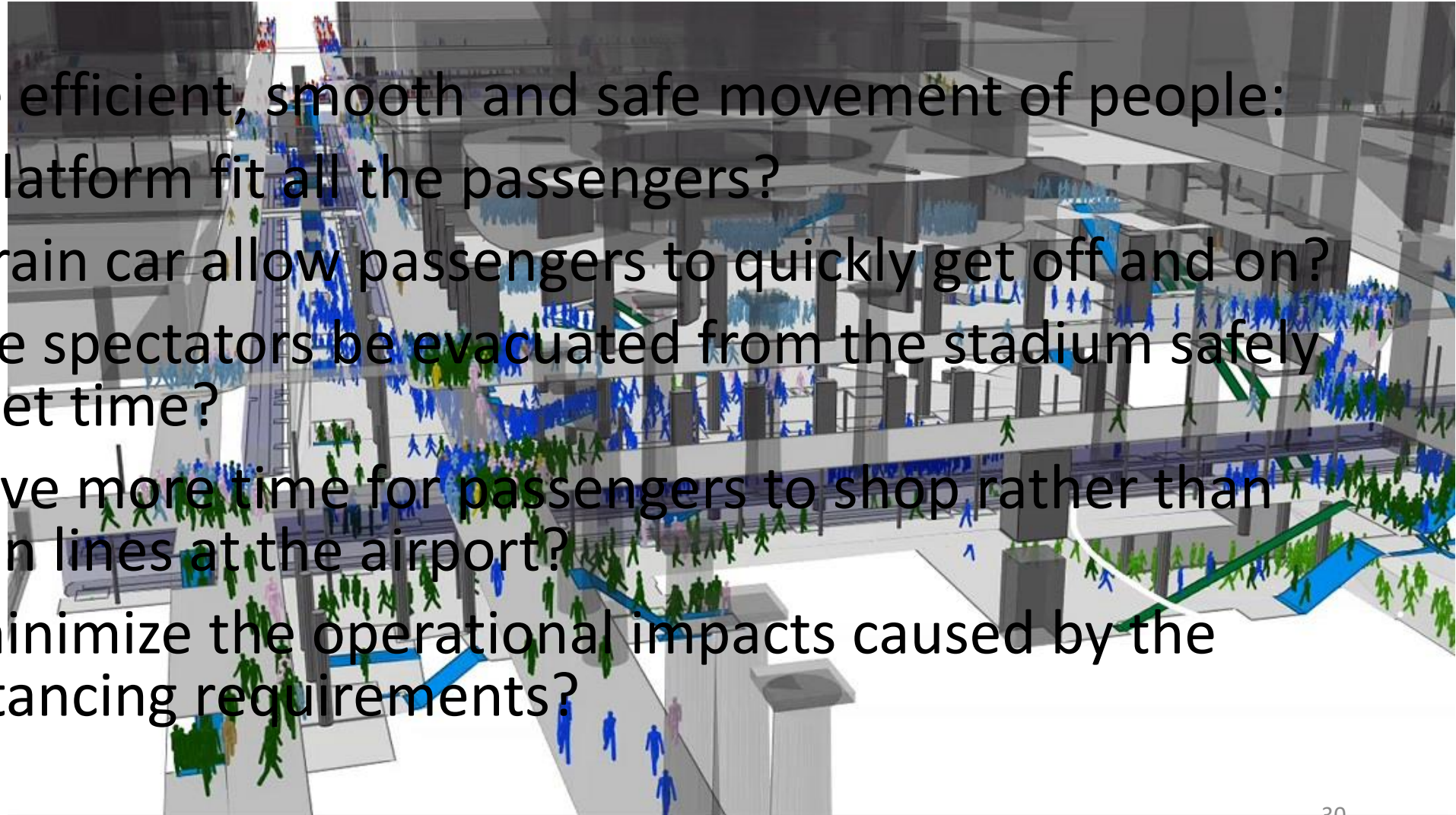
- BIM  $\neq$  3D
- BIM – a tool and a process
- BIM encourages cooperation





# OUR PRESENT. SIMULATIONS

- To ensure efficient, smooth and safe movement of people:
- Can the platform fit all the passengers?
- Can the train car allow passengers to quickly get off and on?
- Can all the spectators be evacuated from the stadium safely within a set time?
- How to give more time for passengers to shop rather than standing in lines at the airport?
- How to minimize the operational impacts caused by the social distancing requirements?



# OUR PRESENT



Pedestrian simulation software

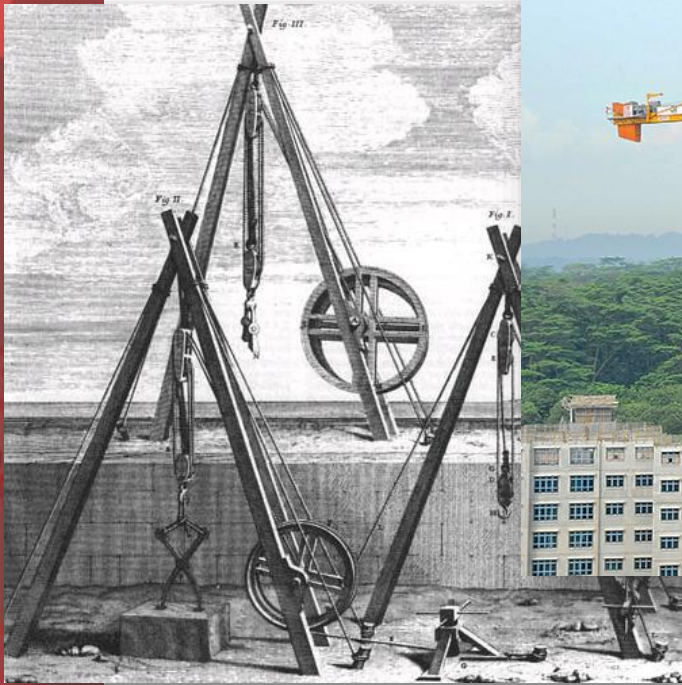
# OUR PRESENT

WHY ARE WE SO SUCCESSFUL?



# OUR PRESENT. MODERN TECHNOLOGIES

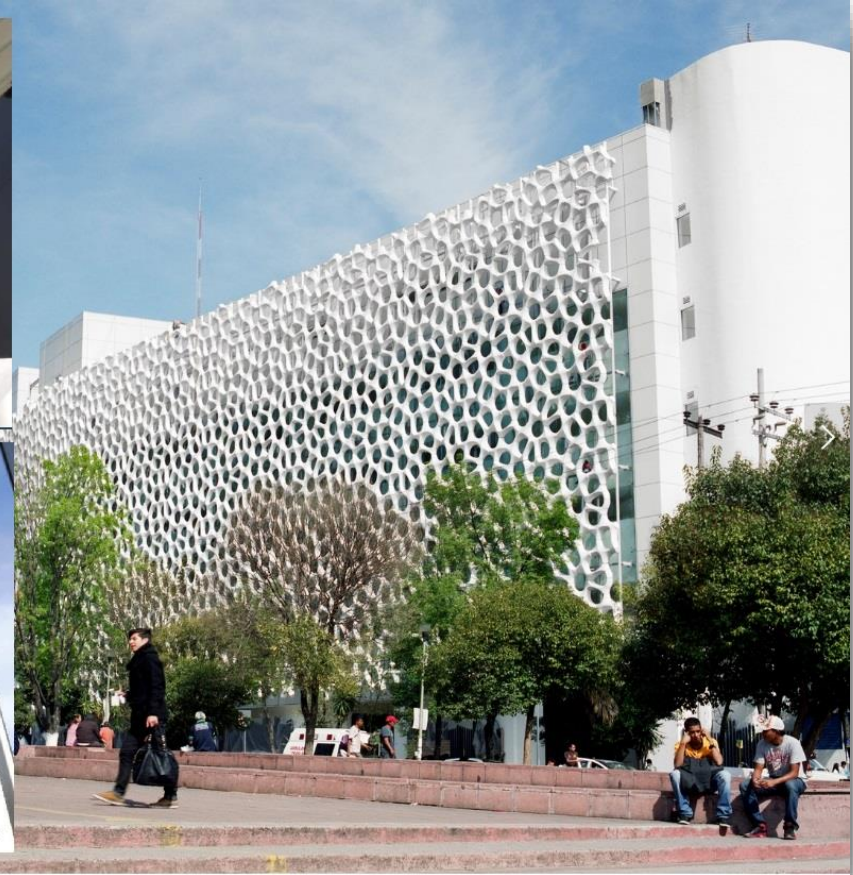
Construction  
machinery





# OUR PRESENT. MODERN TECHNOLOGIES

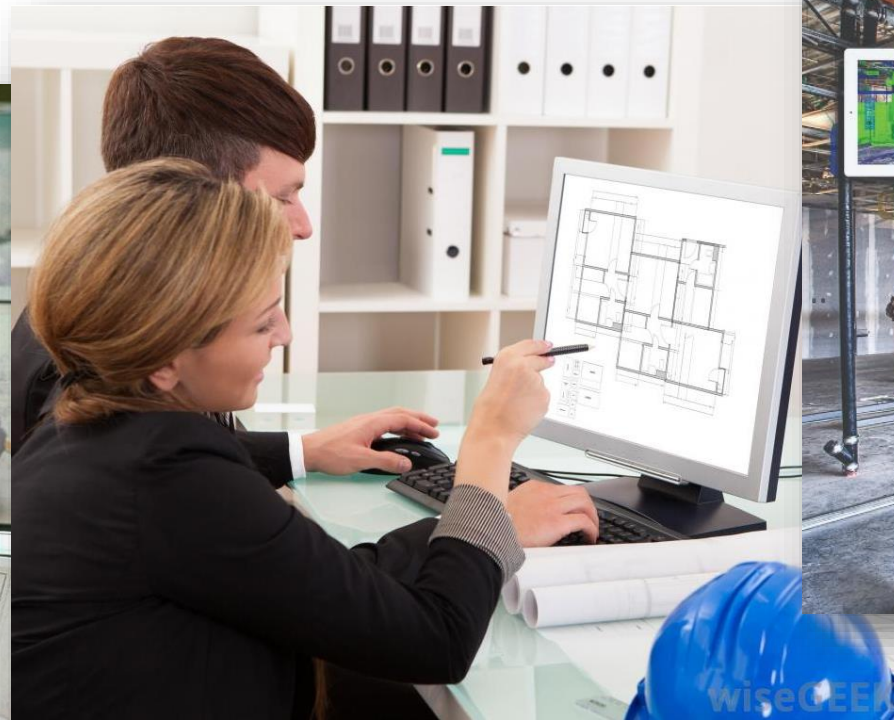
Chemical and materials  
technology





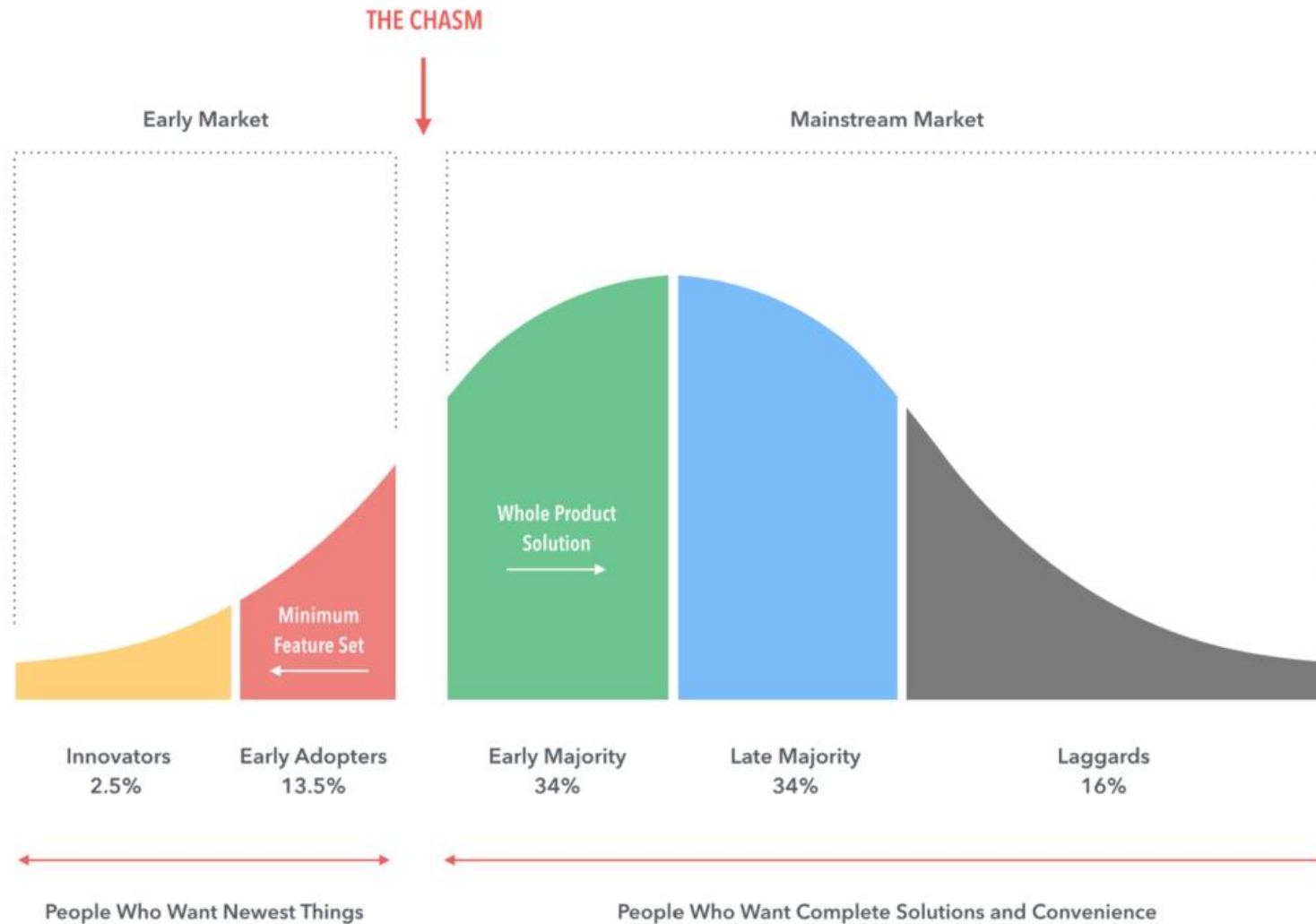
# OUR PRESENT. MODERN TECHNOLOGIES

## ICT technologies

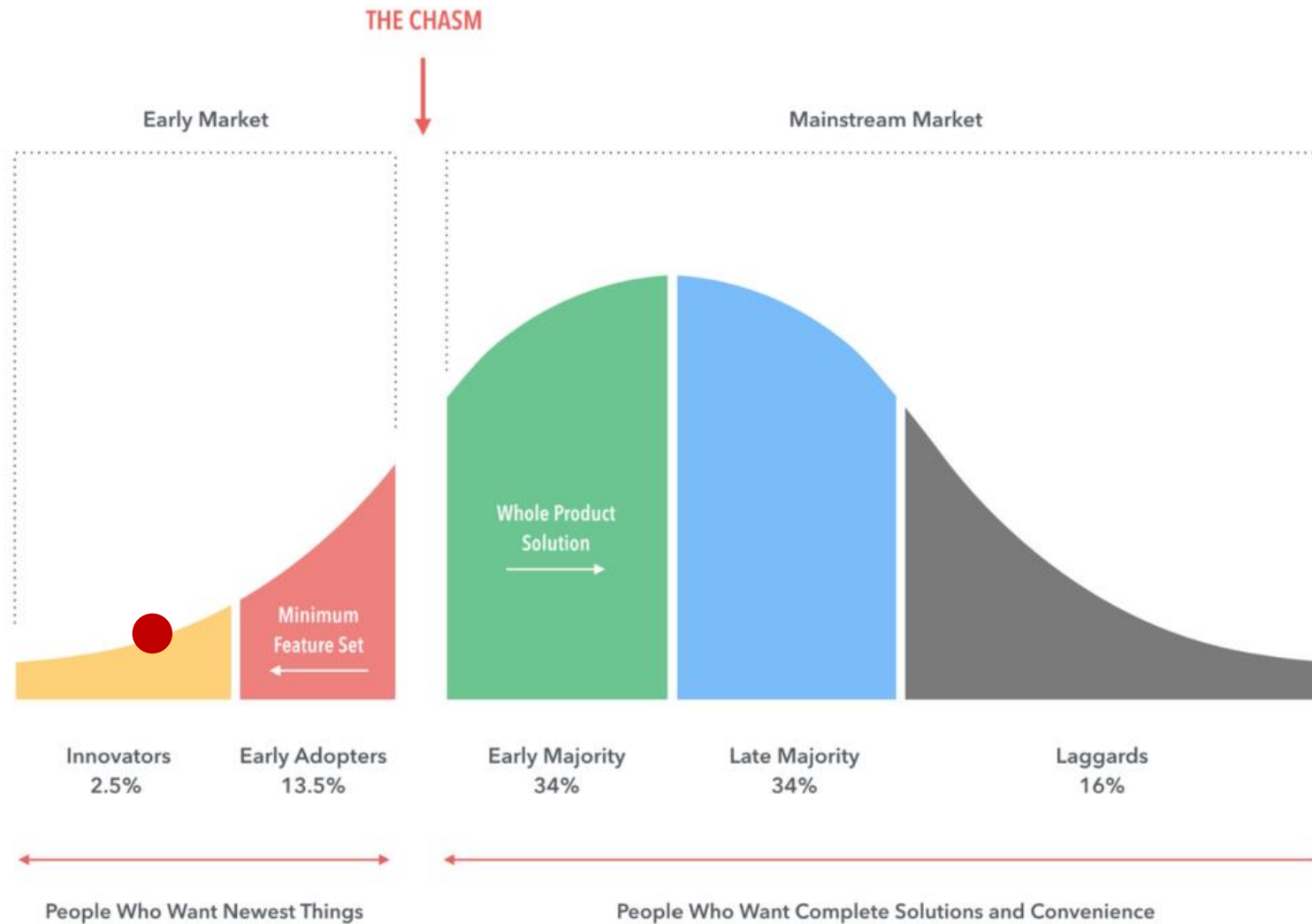




# OUR PRESENT. QUIZ



# OUR PRESENT. QUIZ



# OUR PRESENT. MODERN CONSTRUCTION

- Tight cooperation
- Trust
- Shared responsibilities and risks
- Focus on people
- The project as a whole
- Using BIM



# OUR PRESENT. WHERE IS THE ERROR?



# OUR DISCUSSION SESSION

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  - Please use a paper and a pen to write down your ideas and keywords.
- When you are in the breakout room, you will have 15 min to discuss a question.



# OUR PRESENT. DISCUSSION SESSION

## Learning from the present

Discuss with your groupmates:

In your opinion, is the build environment capable of giving an adequate response to today's challenges?

What should have been done in the build environment to secure the right response to the challenges? What exciting solutions, technologies, appliance, standards could have been used/applied already?

1. Choose a presenter of your group (he/she will report the ideas).
2. Write down the name of the presenter.
3. Discuss.
4. Keyword or main ideas should be written in the end of the form.
5. Submit the form!
7. You should send at least one filled form from your group.
6. You have 25 minutes.



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# OUR FUTURE

Incorporating Antivirus-built Environment Strategies into Construction  
Project Management and Technology

# OUR FUTURE

**WE ARE NOT  
READY FOR THE  
NEXT EPIDEMIC**



[Bill Gates: The next outbreak? We're not ready. TED 2015](#)

# OUR FUTURE. URBAN APPROACHES

- Expanding horizontally
- Fewer density cities
- Decentralization
- Urban farming
- Fewer cars, more cycling, walking

# OUR FUTURE. ARCHITECTURE APPROACHES

- Self-sufficient strategies
- Refocusing on green spaces
- Low-rise buildings
- Better air quality

# OUR FUTURE. CONSTRUCTION STRATEGY

- Modular construction
- Adaptive reuse
- Lightweight & adaptable structures
- Hygienic building materials



# OUR FUTURE. CONSTRUCTION STRATEGY

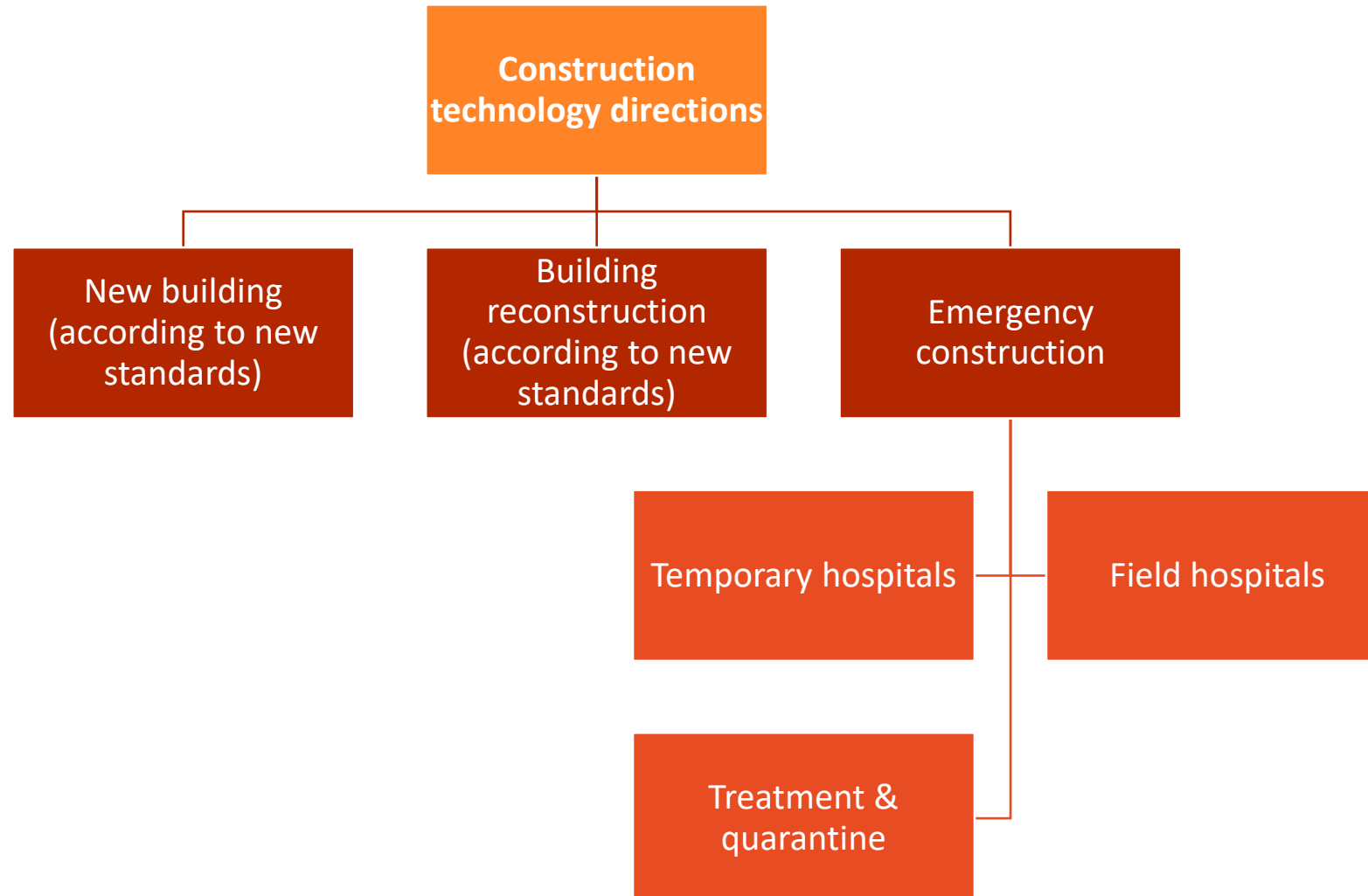
- A 60,000-square-metre structure with space for 1,000 beds and 30 intensive care wards, all built in just 10 days.



# OUR FUTURE. DIGITAL TRANSFORMATION

- Ability to work from home
- Artificial intelligence
- Touchless technologies
- BIM technologies

# OUR FUTURE



# OUR DISCUSSION SESSION

- I will prepare breakout rooms; you will be invented.
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- For those who are together physically, no breakout room is needed.
  - Please use a paper and a pen to write down your ideas and keywords.
- When you are in the breakout room, you will have 15 min to discuss a question.

# OUR FUTURE

*If we start now, we could be ready for the next epidemic.*

*Bill Gates (2015)*



# OUR FUTURE. DISCUSSION SESSION

## Learning from the future

Discuss with your groupmates, what actions should we really undertake to be ready? What build environment domains should we develop and how?

1. Choose a presenter of your group (he/she will report the ideas).
2. Write down the name of the presenter.
3. Discuss.
4. Keyword or main ideas should be written in the end of the form.
5. Submit the form!
7. You should send at least one filled form from your group.
6. You have 20 minutes.

# +/ $\Delta$ SESSION

+

THINGS WE SHOULD KEEP IN THE  
COURSE?

$\Delta$

THINGS TO ADD OR IMPROVE?



## Questions or concerns:

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**THANK YOU FOR YOUR ATTENTION!**