BUILDING INFORMATION MODELLING
MODELOWANIE DANYCH BUDOWLANYCH

Introduction to
Building Information Modelling

Adam Glema Poznań University of Technology PKN-KT 232-GP2 CEN-TC 442-WG1-WG4

- BUILDING
- INFORMATION
- MODELling

- BUILDING
- **INFORMATION**
- MODELling

1. «message or communicate something»

- **BUILDING**
- **INFORMATION**
- MODELling

1. «message or communicate something»

Example:

- brick
- wall
- window
- chair

ALPHANUMERIC INFORMATION

- BUILDING
- **INFORMATION**
- MODELling

1. «message or communicate something»

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

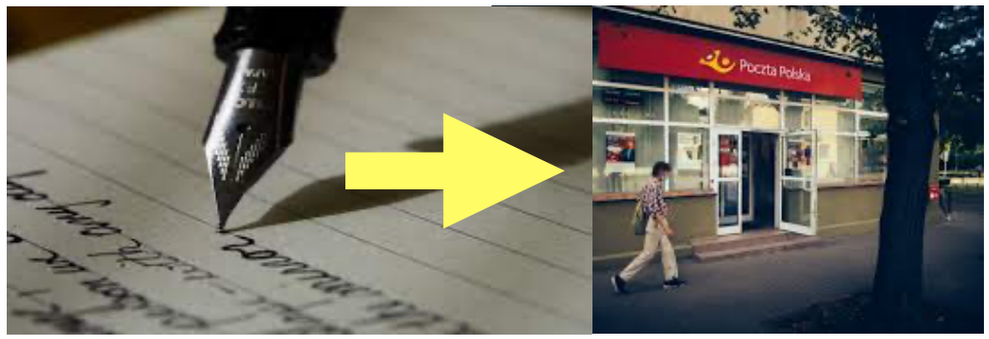
1. «message or communicate something»

30 min

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

1. «message or communicate something»



30 min **1120 min**

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

1. «message or communicate something»

30 min **1120 min** **2160 min**

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

1. «message or communicate something»

30 min **1120 min** **2160 min** **180 min**

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

1. «message or communicate something»

30 min **1120 min** **2160 min** **180 min** **150 min**

- BUILDING
- **INFORMATION**
- MODELling

ANALOG

1. «message or communicate something»

30 min | 1120 min | 2160 min | 180 min | 150 min | 20 min

2,5 days [3560 min]

- BUILDING
- **INFORMATION**
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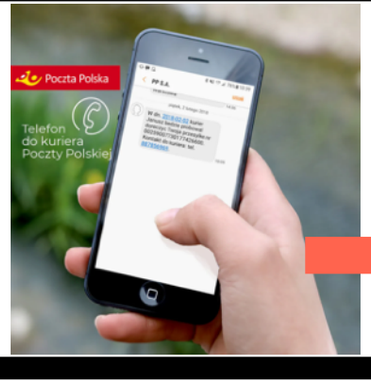
DIGITAL

1. «message or communicate something»

30 min | **1120 min** | **2160 min** | **180 min** | **150 min** | **20 min**



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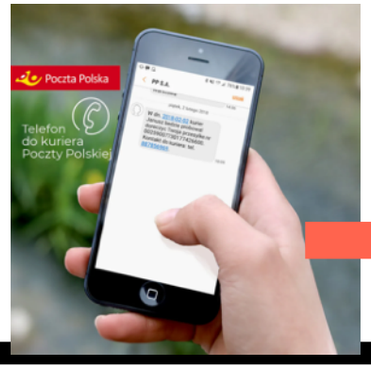

0,15 s [0,0025 min]

- BUILDING
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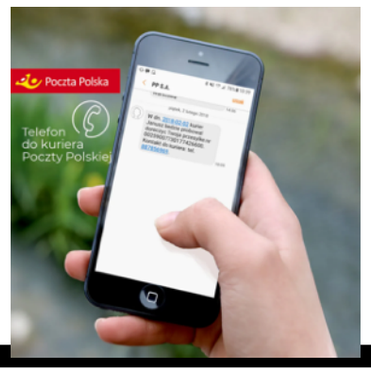
ANALOG

DIGITAL

1. «message or communicate something»

ANALOG



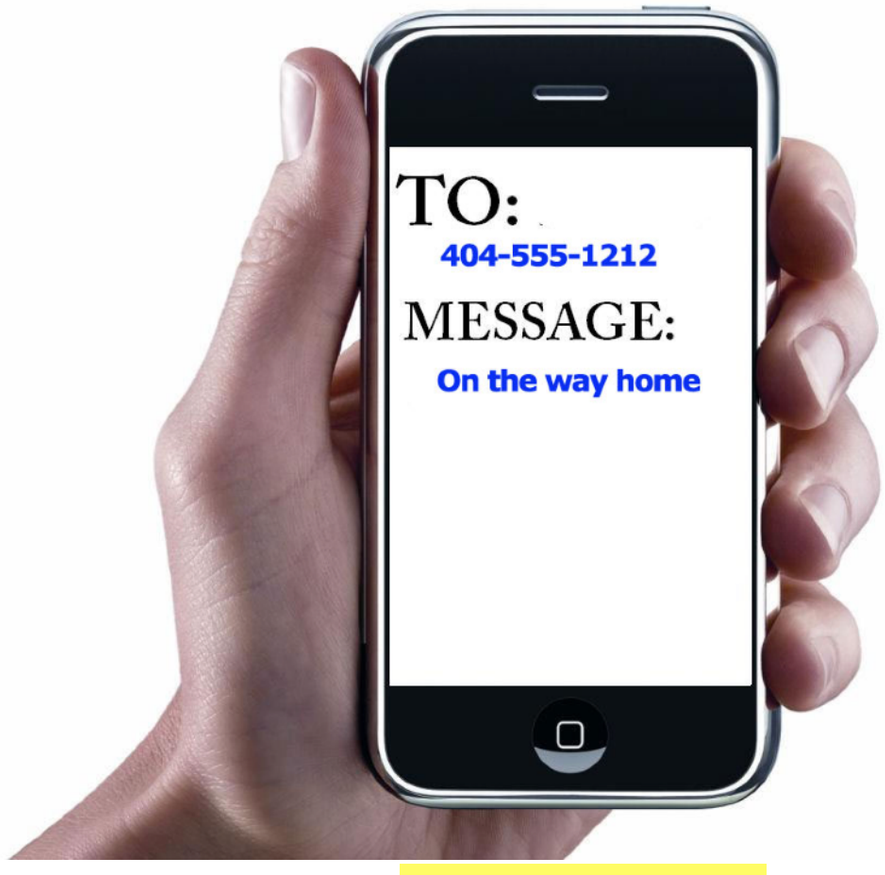
DIGITAL

SMS 1 424 000 : 1 TELEGRAM

- BUILDING
- **INFORMATION**
- MODELling

1. «message or communicate something»

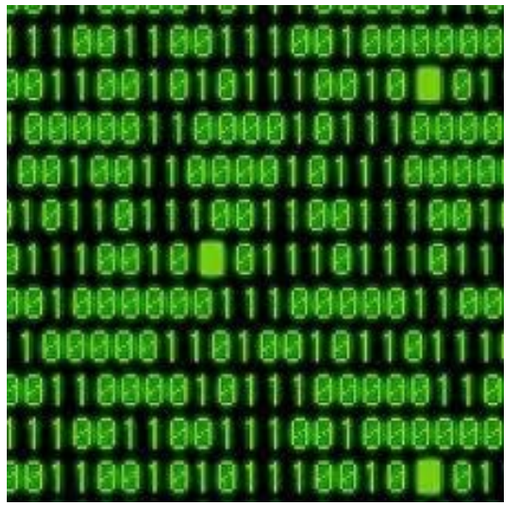
ANALOG



DIGITAL

- **BUILDING**
- **INFORMATION**
- MODELling

1. «message about something or communicate something »
2. «office/institution department/desk»



DIGITAL

ANALOG

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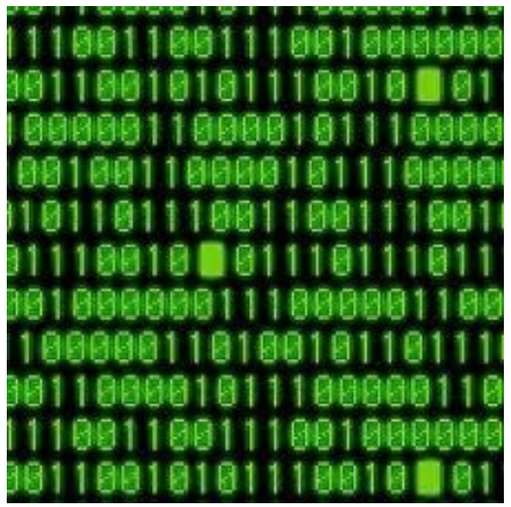


1. «message about something or co[illegible] »
2. «office/institution department/desk»
3. **«data processed by computer»**

- explicit / public
- protected / internal
- confidential
- secret

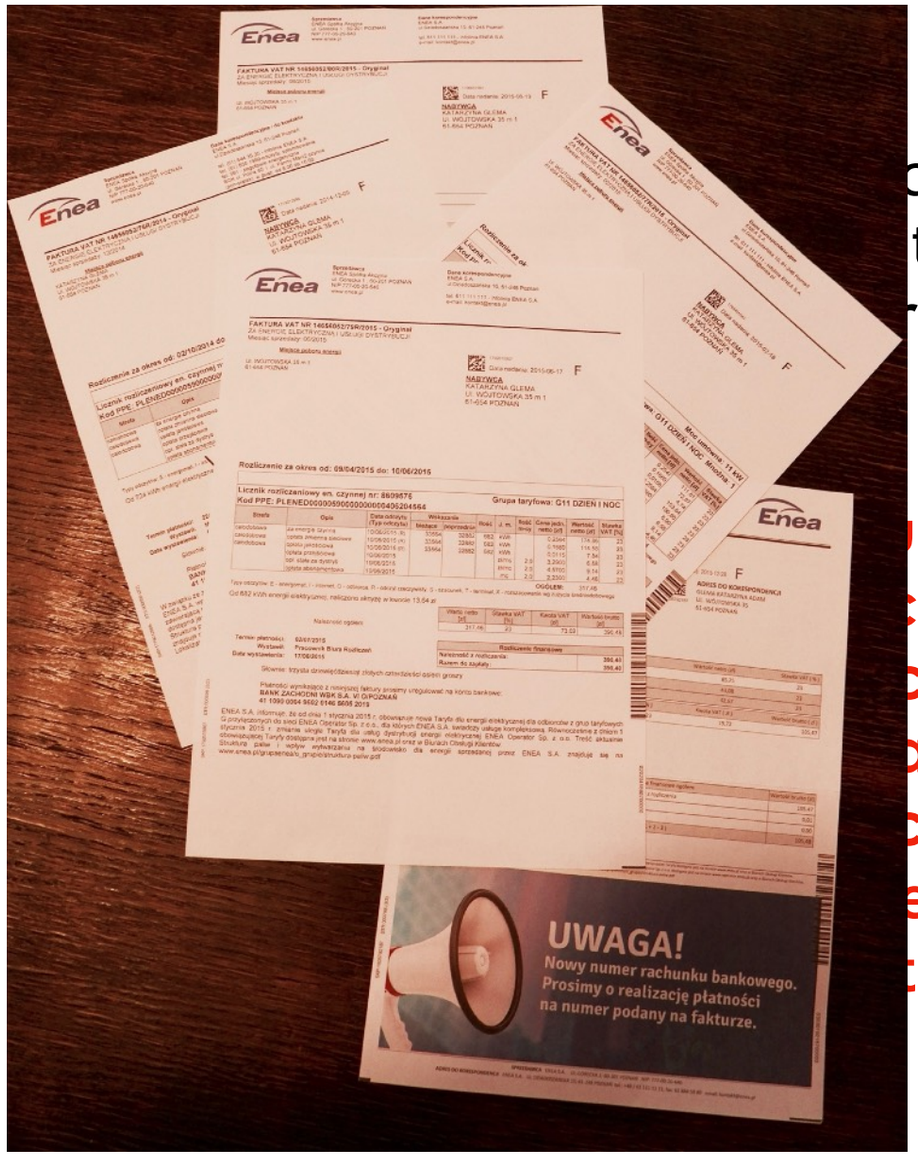
- up-to-date
- complete
- clear
- available
- controlled
- easy to modify

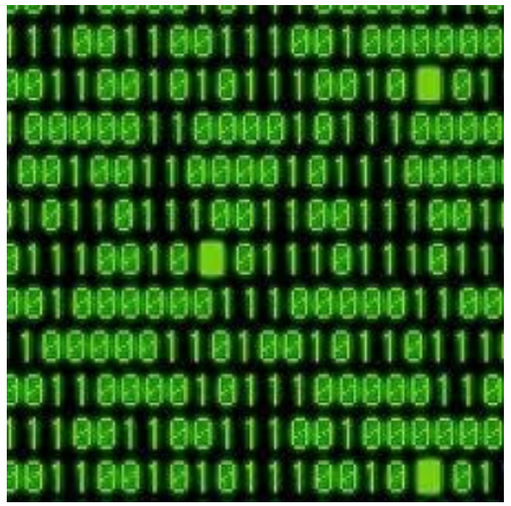
- text
- drawing
- photo
- video
- data
- .....
- model

- specify
- write
- order
- transmit
- read
- process
- present
- archive
- encrypt
- delete

DIGITAL

- BUILDING
- INFORMATION





co… g »
t/desk»
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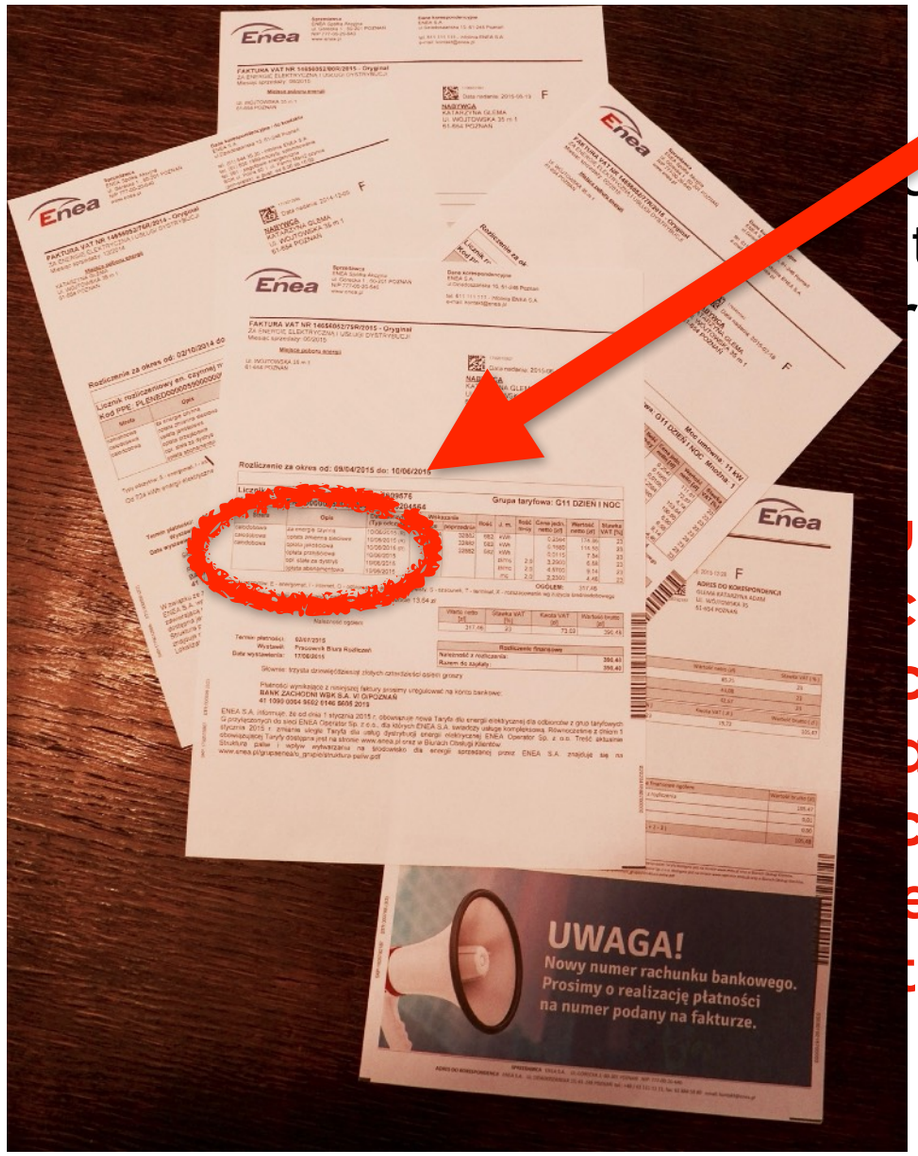

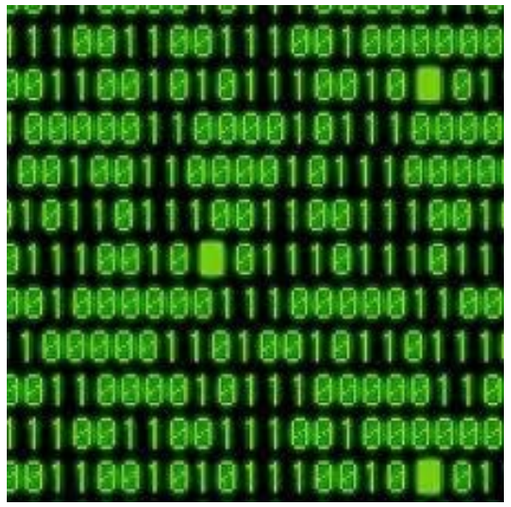

» t/desk» r»

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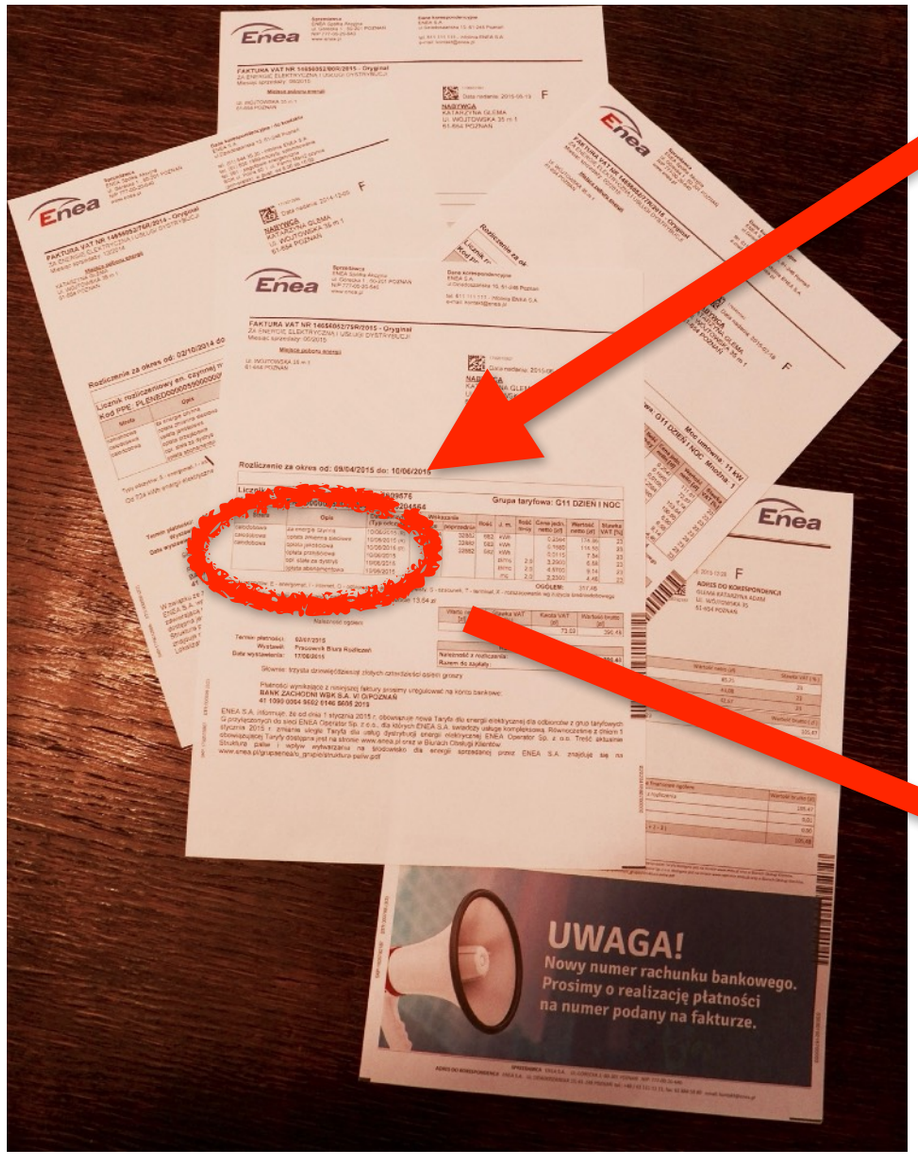

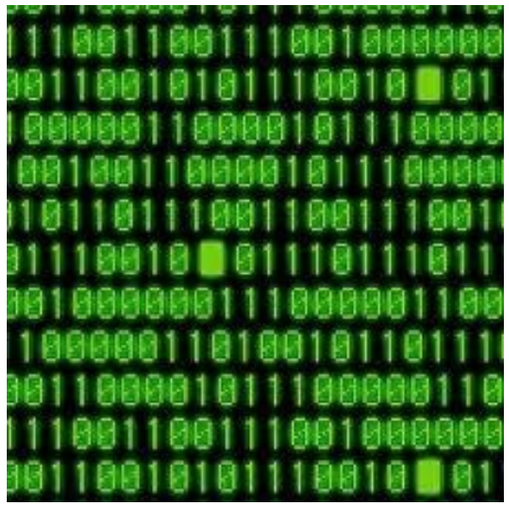

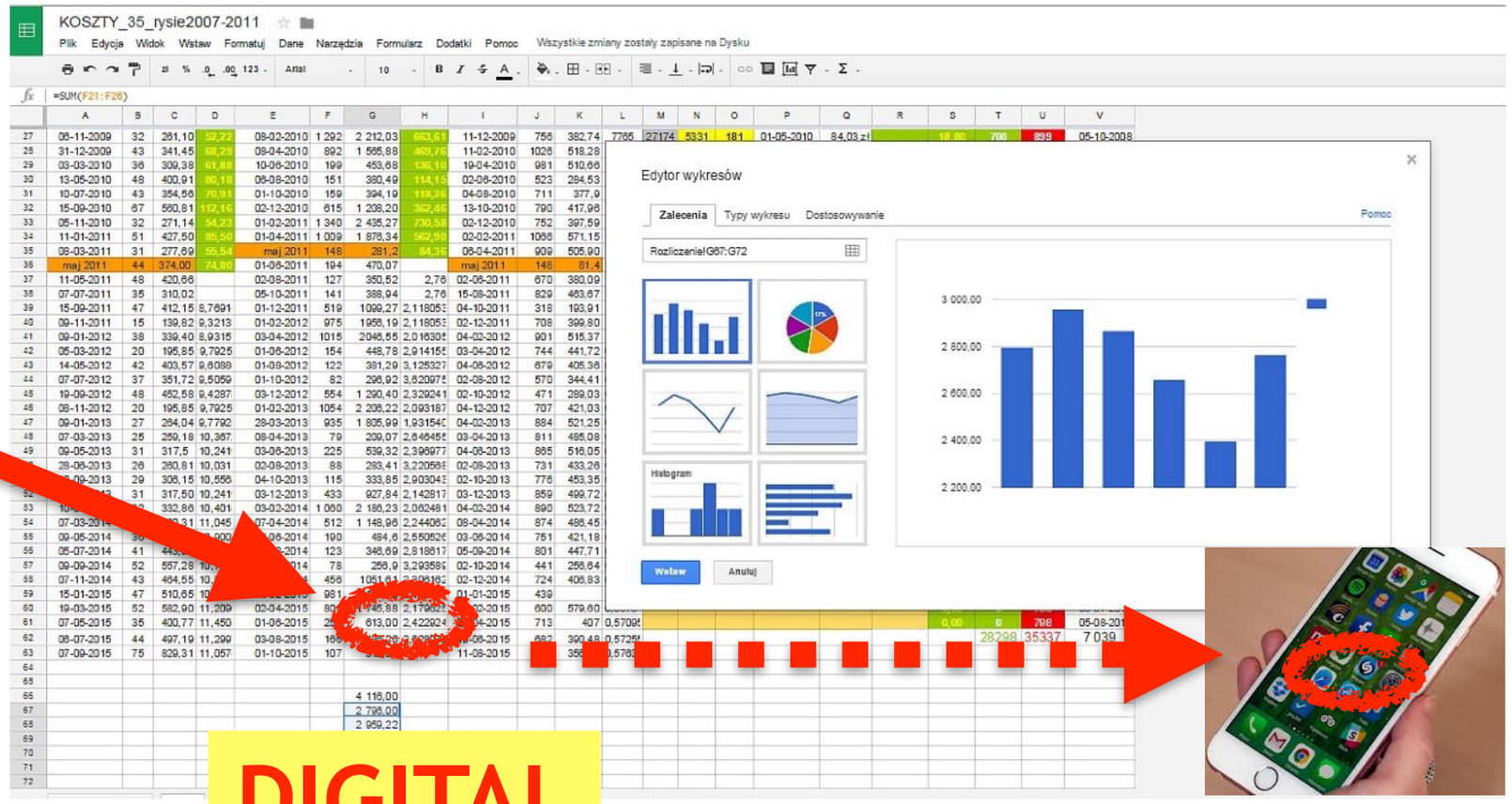

DIGITAL

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- **INFORMATION**
- MODELling

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- BUILDING
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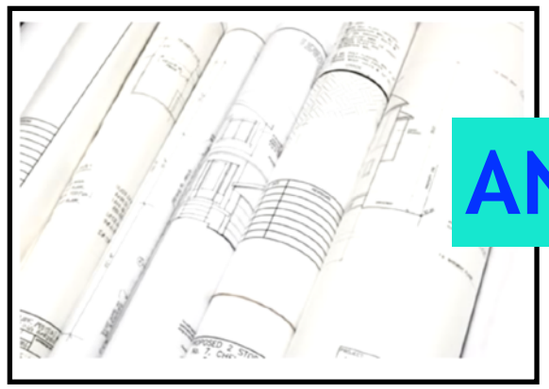

ANALOG

DIGITAL

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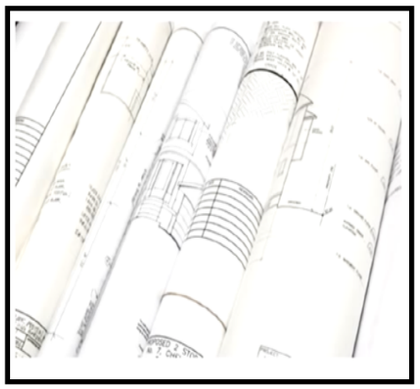

Concept & Designing of investment assets
Paper version of Tech Documentation

- BUILDING
- **INFORMATION**
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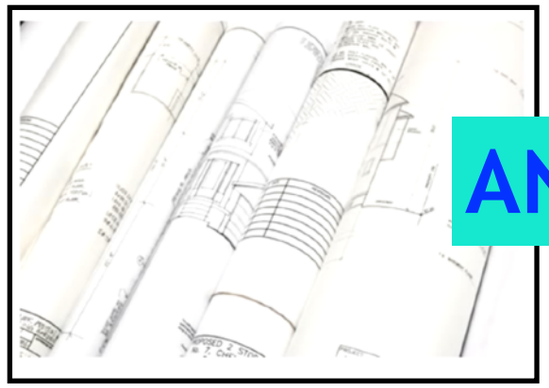

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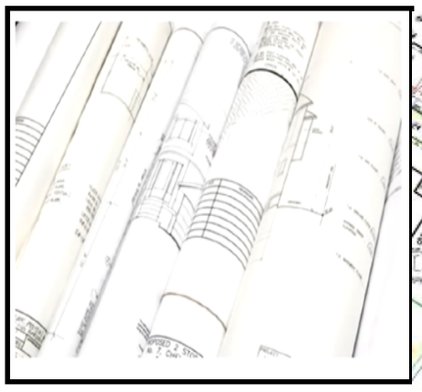
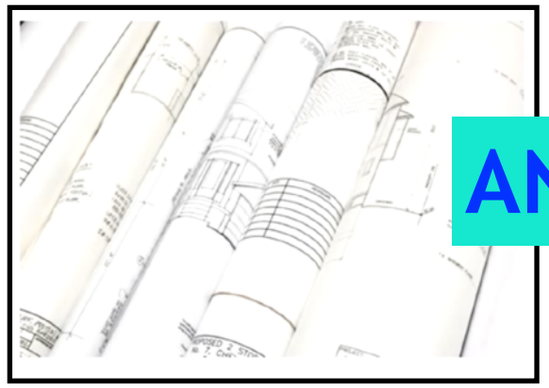


Obtaining geodesy & geotechnical data
Paper Location Maps

- BUILDING
- **INFORMATION**
- MODELling



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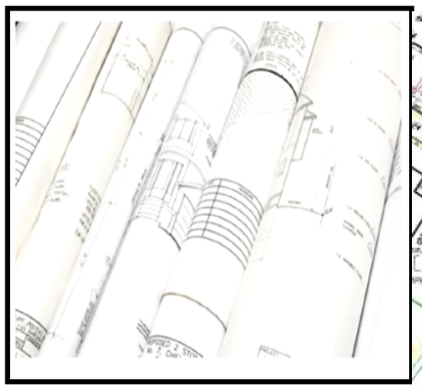
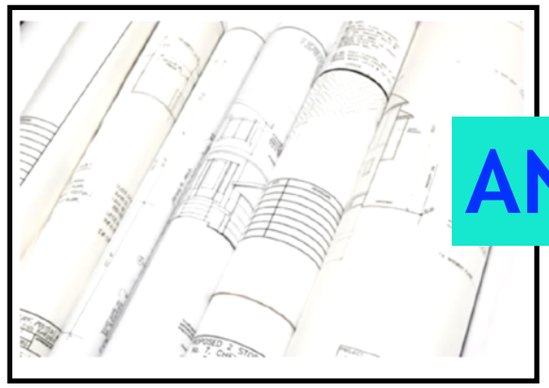


Approved Location Maps
Paper version of Admin Decision

- BUILDING
- **INFORMATION**
- MODELling



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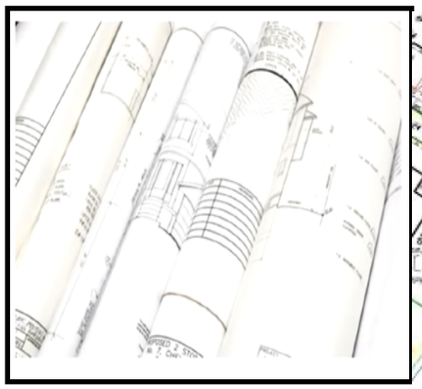
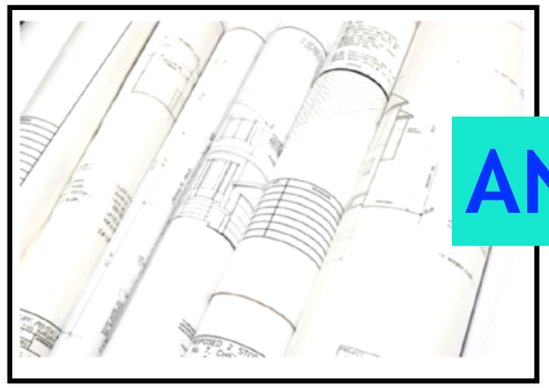


Submission for Building Permit
Paper version of Docs

- BUILDING
- **INFORMATION**
- MODELling



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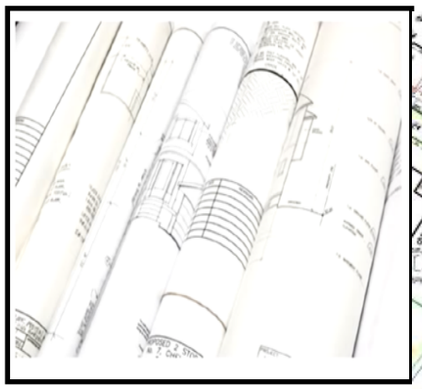

Approved Building Permit
Paper version of Admin Decision

- BUILDING
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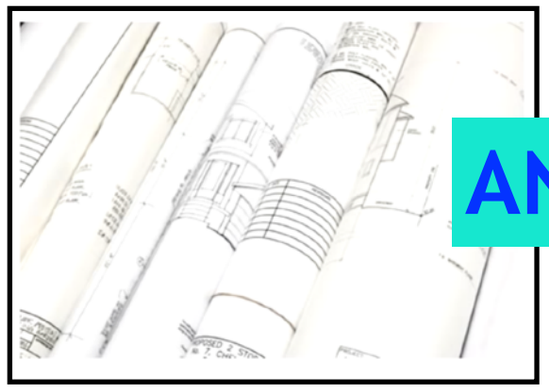

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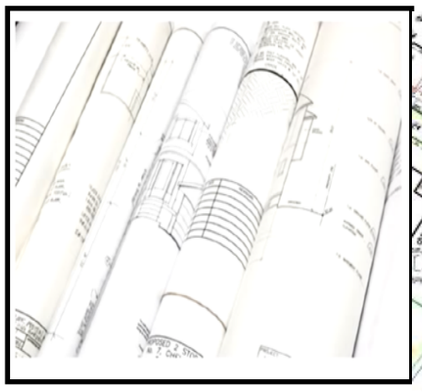
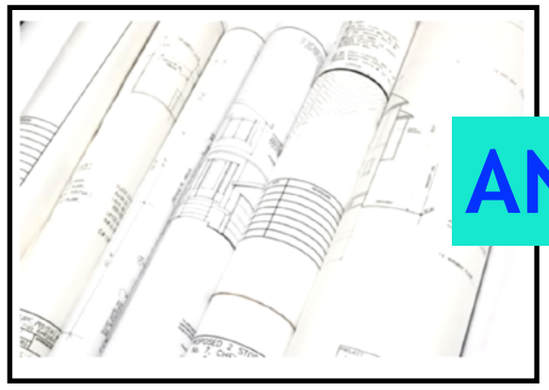


time months and $$$

Paper version of Tech Documentation
Construction on Building Site

time days and $$$

- BUILDING
- **INFORMATION**
- MODELling



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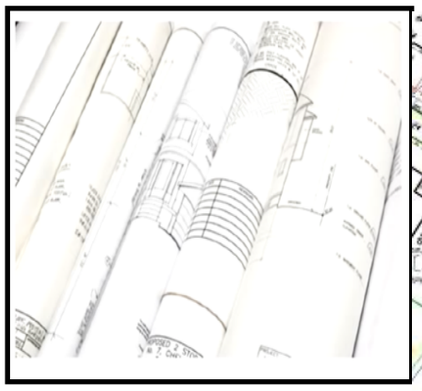
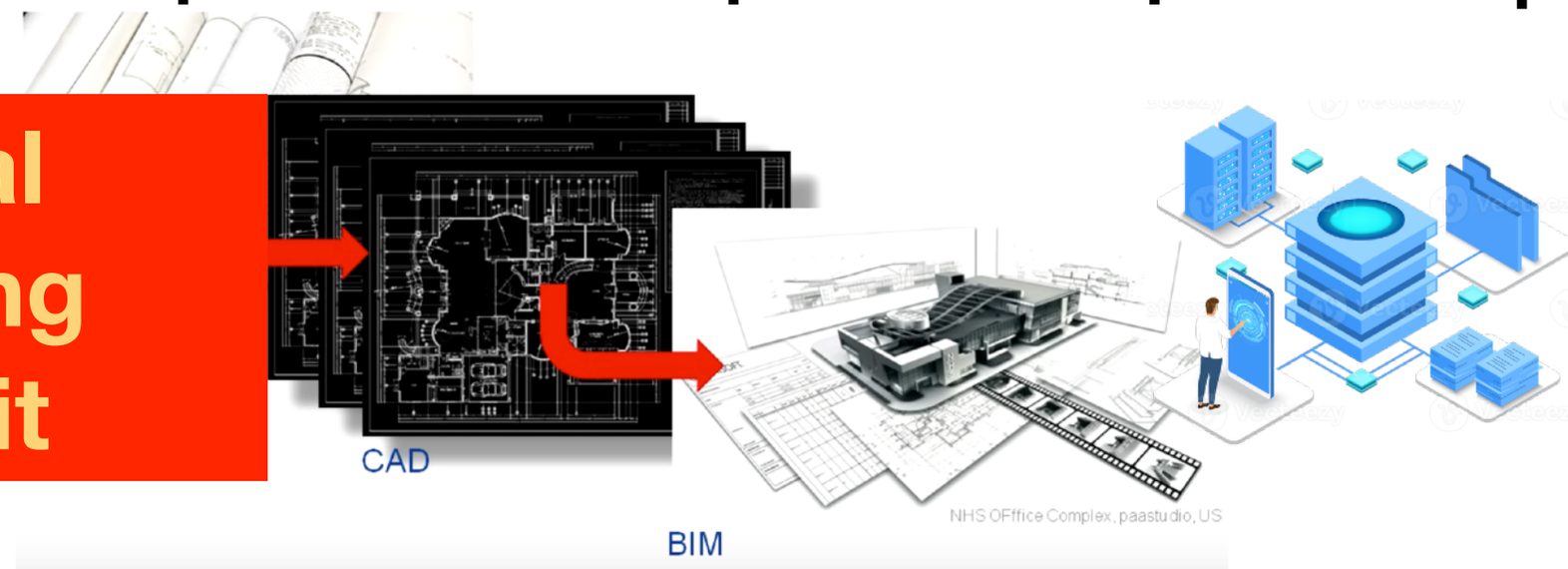
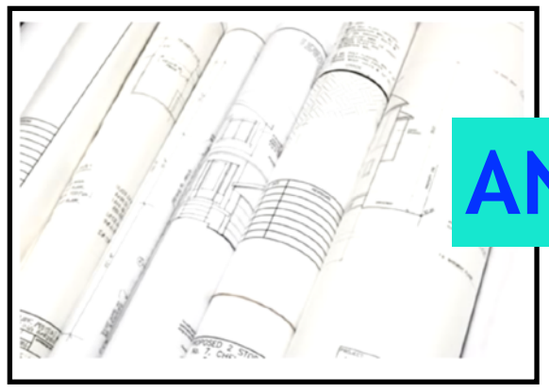


Digital Building Permit



B I M - MODEL - INFORMATION - CHECK

- BUILDING
- **INFORMATION**
- MODELling



ANALOG

DIGITAL

1. «message or communicate something»

Traditional ANALOG Building Permit

DIGITAL Building Permit - DataBase - BIG Data

- BUILDING
- INFORMATION
- MODELling

OPERATIONS for INFORMATION

NEW	MOVE	ACT	OLD

write	order
present	specify
delete	read
archive	transmit
encrypt	process

- BUILDING
- INFORMATION
- MODELling

OPERATIONS for INFORMATION

NEW	MOVE	ACT	OLD
create	order	approve	archive
generate	transmit	review	delete
deliver	exchange	retrive	encrypt
specify	process	assemble	erase
model	present	federate	write
read	manage	accept	store
versione	modify	verify	

- BUILDING
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NEW	MOVE	ACT	OLD
create	order	approve	archive
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versione	modify	verify	

NEW

create

model

generate

specify

deliver

read

version

INPUT		OUTPUT
no information	→	information exists
information requirement	→	delivery of information
no owner of information	→	owner use
no user of information	→	single use
random name/numer	→	keep name/number order

- BUILDING
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NEW	MOVE	ACT	OLD
create	order	approve	archive
generate	transmit	review	delete
deliver	exchange	retrive	encrypt
specify	process	assemble	erase
model	present	federate	write
read	manage	accept	store
versione	modify	verify	

MOVE

order

transmit

exchange

process

present

manage

modify

INPUT		OUTPUT
information exists	→	information acquisition
requirement to move	→	information new delivery
information primary owner	→	owner shares use
single use	→	collaborative use
single access	→	multiple access
work in progress data state	→	shared data state

- **BUILDING**
- **INFORMATION**
- **MODELling**

NEW	MOVE	ACT	OLD
create	order	approve	archive
generate	transmit	review	delete
deliver	exchange	retrive	encrypt
specify	process	assemble	erase
model	present	federate	write
read	manage	accept	store
versione	modify	verify	

ACT

review

verify

retrive

approve

assemble

federate

accept

INPUT		OUTPUT
information checking	→	updated quality
stated requirements	→	requirements fulfilled
work in progress data state	→	shared data state
one branch BIM model	→	merged multi model
new delivered model	→	designer + proofreader

- **BUILDING**
- **INFORMATION**
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NEW	MOVE	ACT	OLD
create	order	approve	archive
generate	transmit	review	delete
deliver	exchange	retrive	encrypt
specify	process	assemble	erase
model	present	federate	write
read	manage	accept	store
versione	modify	verify	

OLD

write

store

encrypt

archive

erase

delete

INPUT		OUTPUT
work in progress data state	→	published data state
share exchange information	→	after project status
open alive acts	→	no more full access
information in containers	→	information in storage
constant access service	→	warehouse service

- BUILDING
- **INFORMATION**
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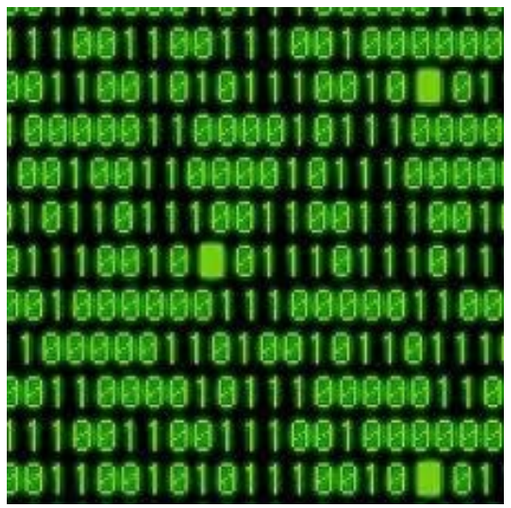

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DIGITAL

INFORMATION:

PAPER

PEN

LINE

INK

REVISION

ANALOG

HAND CAD CAx BIM

e-PAPER

interNET

LINE

TABLET

AutoBIM

DIGITAL

2016

DATA

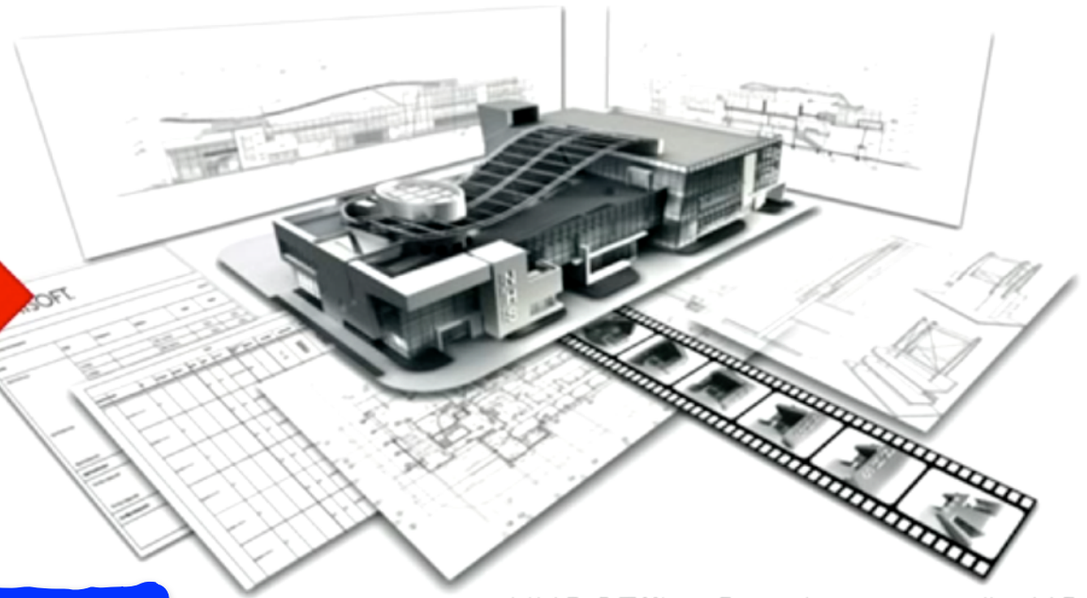
PROCESS

DISCIPLINES

Pape

CAD

BIM

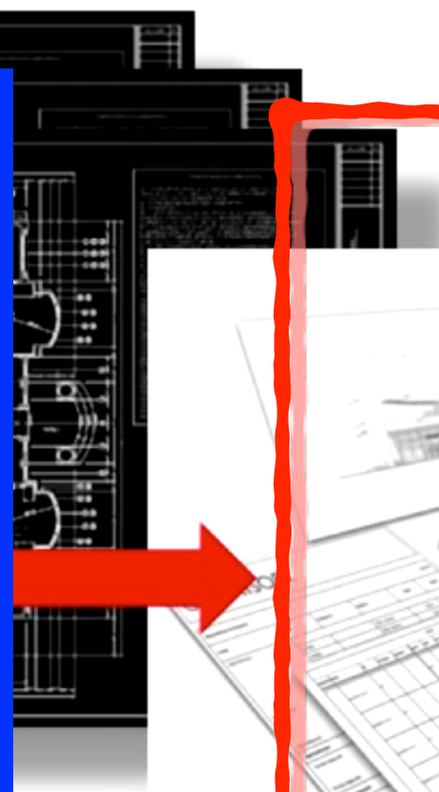


NHS OFffice Complex, paastu dio, US

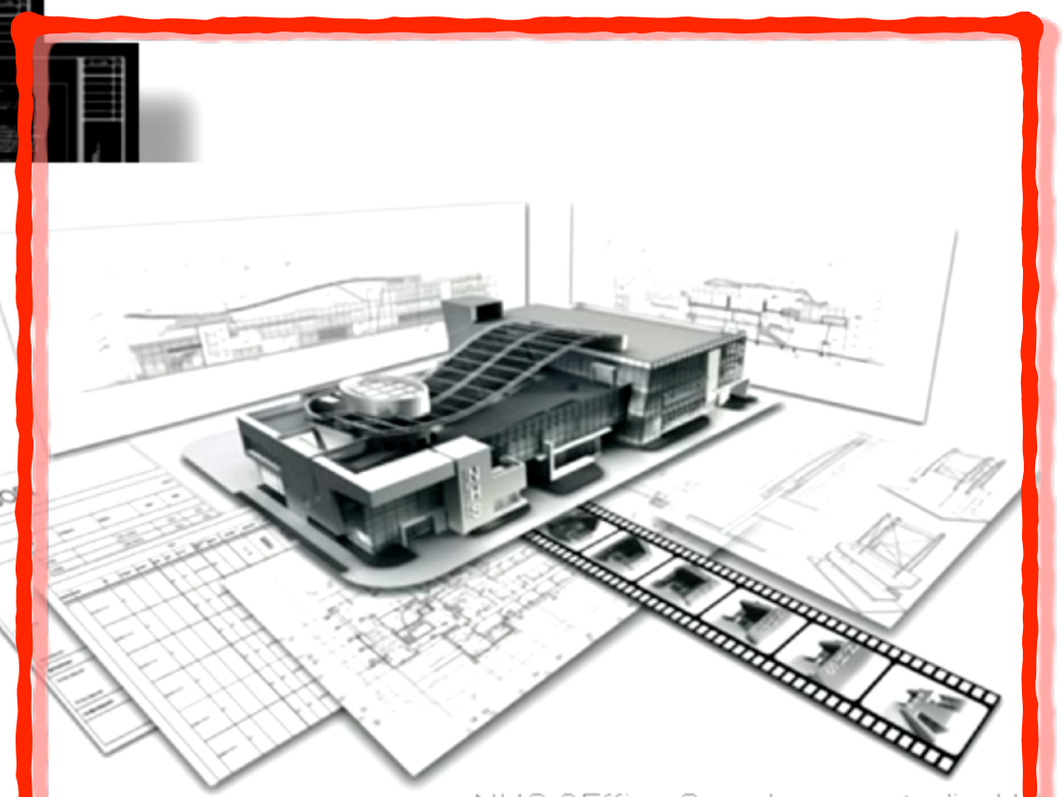
DIGITAL

Paper

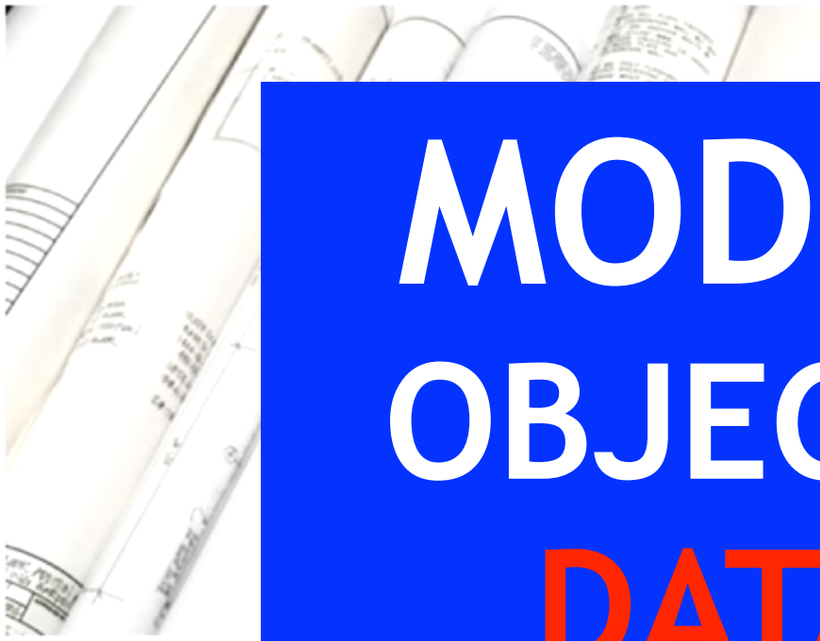
MODELL
OBJECTS
DATA
PROCESS
DISCIPLINES



BIM



NHS OFffice Complex, paastu dio, U



Paper

DIGITAL

MODEL
OBJECTS
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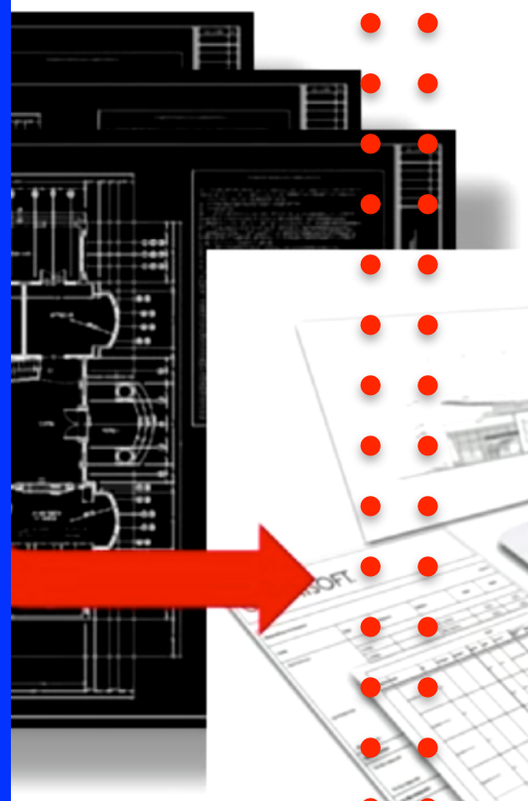
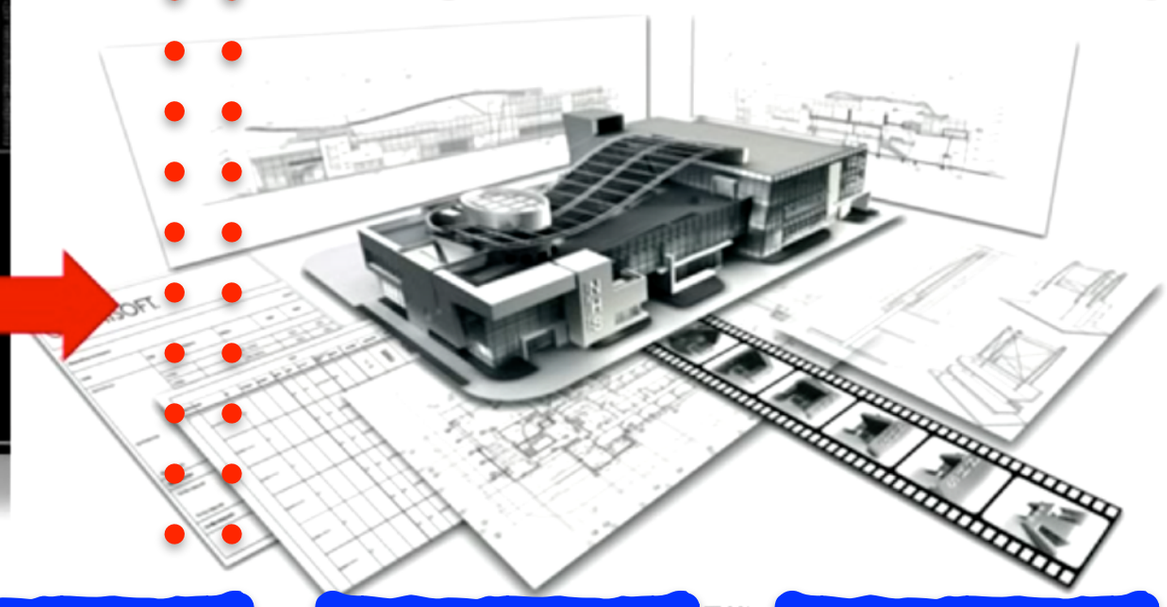


MIND CHANGE

INTER OPERABILITY



BIM BAM BOM

OPEN ASAMBLE OPERATE

- BUILDING
- INFORMATION
- MODELling

7x

ANALOG

DIGITAL 1x

- **BUILDING**
- **INFORMATION**
- **MODELling**

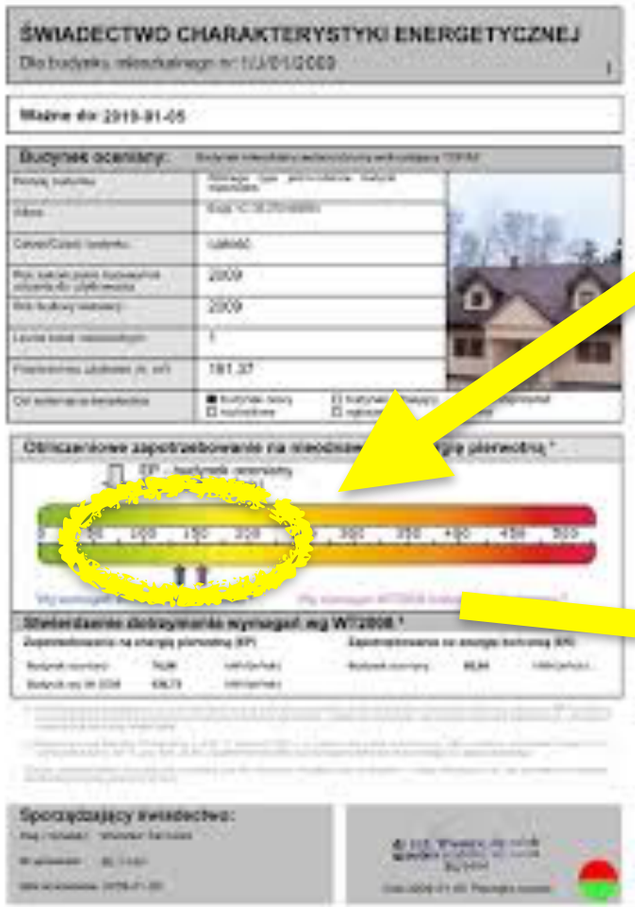
DIGITAL

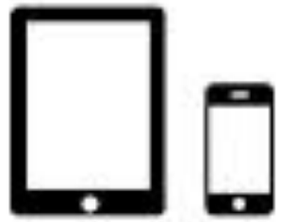
- **BUILDING**
- **INFORMATION**
- **MODELling**

MIND CHANGE

DIGITAL

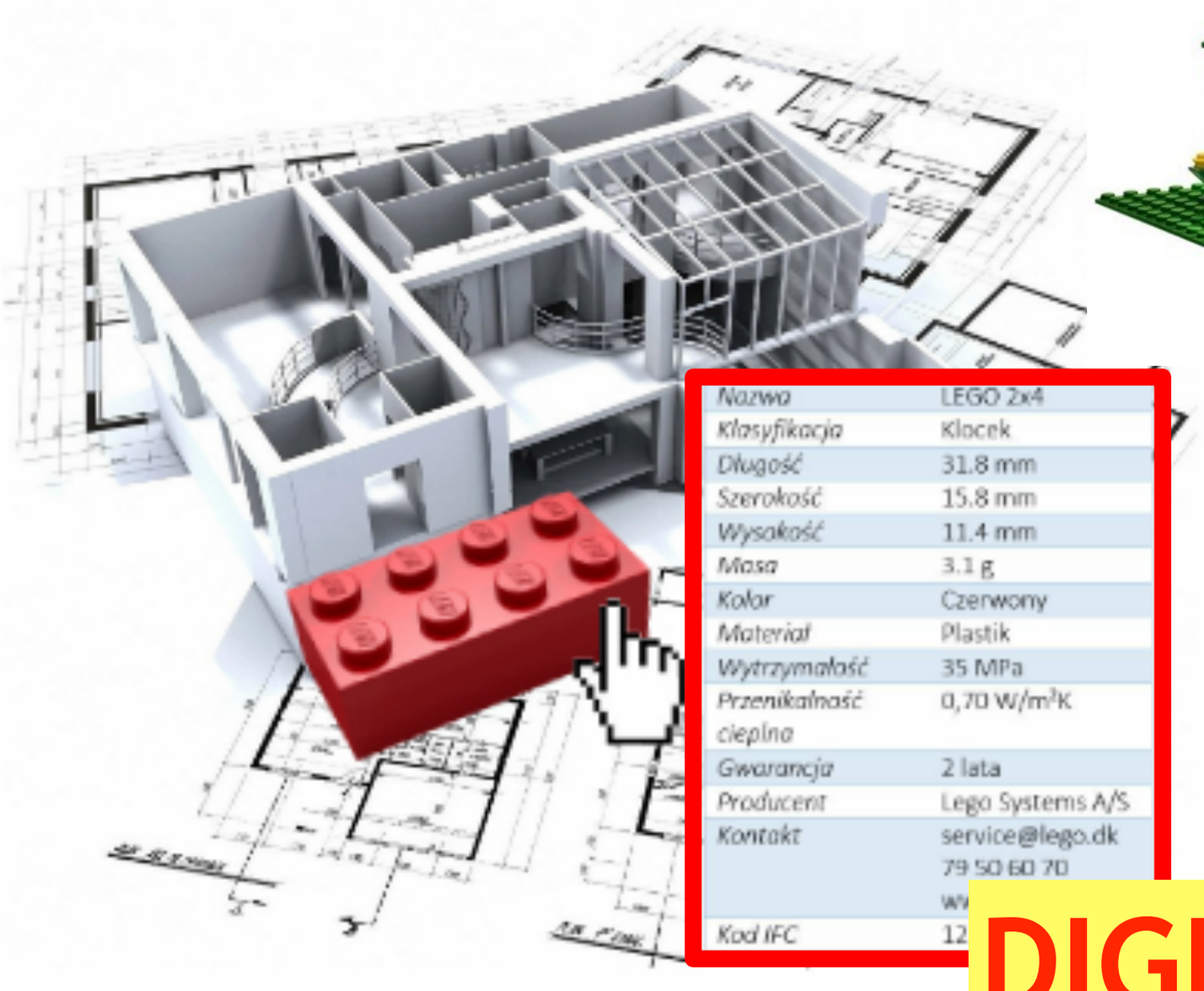
- **BUILDING**
- **INFORMATION**
- **MODELling**





DIGITAL

- definicja cyklu życia– należy przez to rozumieć wszelkie możliwe kolejne lub powiązane fazy istnienia przedmiotu dostawy, usługi lub roboty budowlanej, w szczególności: badanie, rozwój, projektowanie przemysłowe, testowanie, produkcję, transport, używanie, naprawę, modernizację, zmianę, utrzymanie przez okres istnienia, logistykę, szkolenie, zużycie, wyburzenie, wycofanie i usuwanie,



Nazwa	LEGO 2x4
Klasyfikacja	Klocek
Długość	31.8 mm
Szerokość	15.8 mm
Wysokość	11.4 mm
Masa	3.1 g
Kolor	Czerwony
Materiał	Plastik
Wytrzymałość	35 MPa
Przenikalność cieplna	0,70 W/m²K
Gwarancja	2 lata
Producent	Lego Systems A/S
Kontakt	service@lego.dk 79 50 60 70 ww
Kod IFC	12

DIGITAL

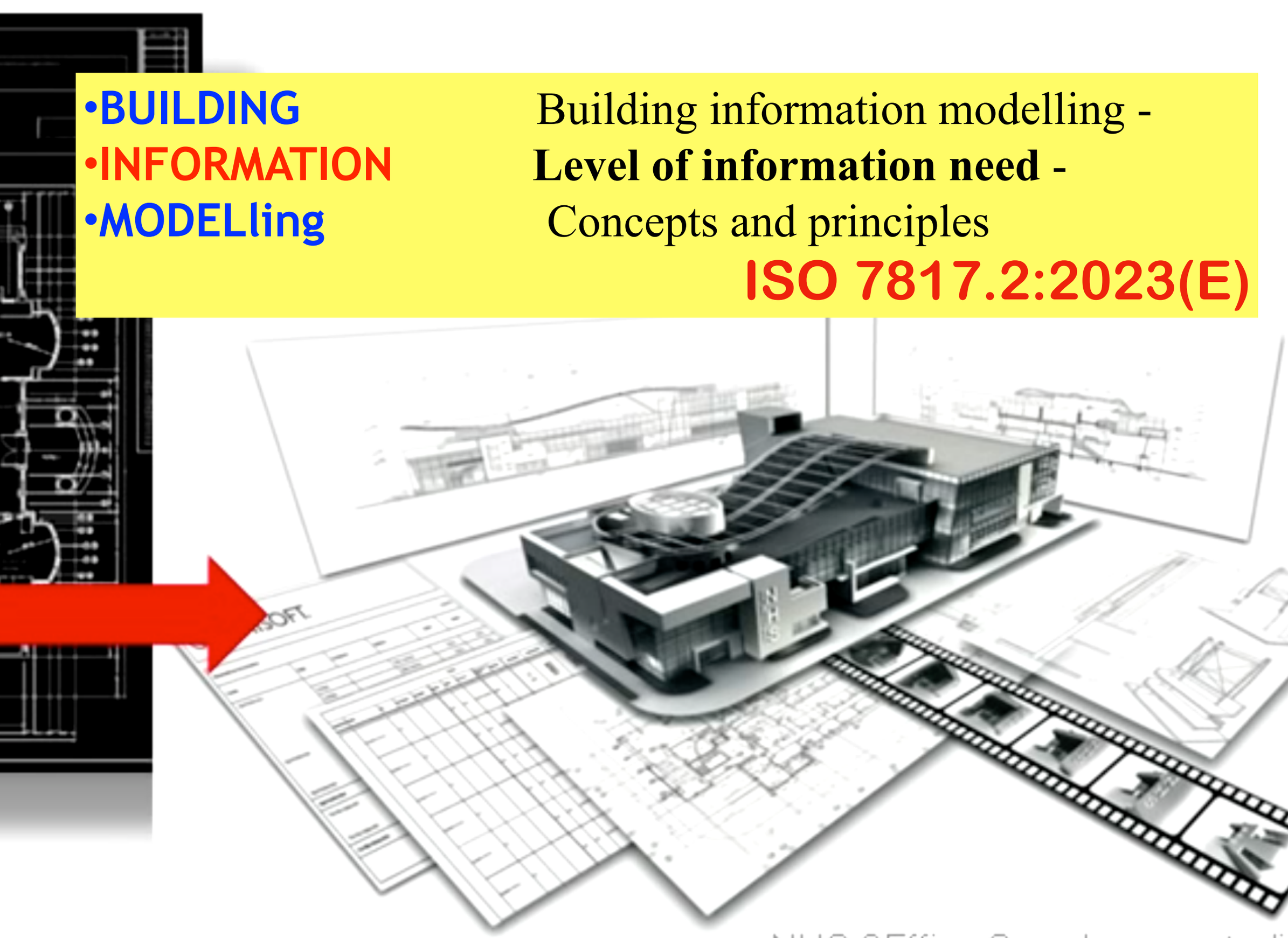
Life cycle phases:

- inception
- design
- construction
- operation
- renovation
- recycling
- ……

- **BUILDING**
- **INFORMATION**
- **MODELling**

Building information modelling -
Level of information need -
Concepts and principles

ISO 7817.2:2023(E)



NHS OFffice Complex, paastudio, US

BIM

- **BUILDING** Modelowanie informacji o obiekcie budowlanym
- **INFORMATION** **Poziom potrzeby informacyjnej -**
- **MODELling** Koncepcje i zasady

ISO 7817

5.1 **Framework to specify the level of information need**

5. 2 — **consider purpose** (**WHY**)

5. 3 — **consider information delivery milestone** (**WHEN**)

5. 4 — **consider actors** (**WHO**)

5. 5 — **consider objects** (**WHAT**)

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - purpose

The purposes is specified to **clarify (WHY) the information is needed**. Level of Information Need for the **purposes that is required for**.

The level of information need does not specify the purposes. The same purpose, the geometrical information, alphanumerical information and documentation can vary for different objects.

For **accessibility analysis**, properties such as the clear opening width of a door, its location, the position and shape of the handle are needed.

Other properties, such as the name of the manufacturer and the acquisition cost, are not relevant to fullfil the purpose.

For **cost analysis** purpose, the acquisition cost of a door is needed, but the appearance of the handle is not relevant.

For **rendering** purpose, the geometrical appearance of a door is relevant, while the name of the manufacturer and the acquisition cost are not.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - purpose

Purpose should not be explicit to all actors in some cases (security reasons). In those cases, the purpose should be considered as “not disclosed” and only authorized actors should be informed.

Purposes can be extracted from

(IOR) Organizational Information Requirements,
(PIR) Project Information Requirements
(AIR) Asset Information Requirements

as described in ISO 19650-1:2018, 5.2, 5.3, 5.4 and ISO 19650-2:2019

At information delivery milestone, the same Level of Information Need required for an object can be used for different purposes.

In concept design, the same geometry information of a block can be used for clash detection and for quantity take off.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - delivery milestone

In specifying the Level of Information Need, information delivery milestones shall be considered.

The information delivery milestones (time axis) should be specified to **clarify (WHEN)** the information is needed.

The Level of Information Need does not specify the information delivery milestones.

At the same information delivery milestone, the geometrical, alphanumerical and documentation can vary for different objects.

For accessibility analysis, usually the same Level of Information Need is required at different milestones.

For energy analysis, different level of information need is required at different milestones.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - actors

In specifying the Level of Information Need, **actors (WHO)** require and deliver the information shall be considered.

The Level of Information Need does not specify the actor(s).

The same Level of Information Need can be required by different actors at milestone to fullfil different purposes.

Different Level of Information Need can be required by different actors at milestone to fullfil the same purpose.

At different milestones, especially in the concept phase, the actor responsible to deliver specified
Level of Information Need might not be specified.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - actors

A client might ask for a specific Level of Information Need for an object at an agreed information delivery milestone without specifying who needs to deliver it. In this case supply chain is free to assign responsibilities as preferred.

Different actors are responsible for different Level of Information Need at the same information delivery milestone to fullfil the same purpose.

For design purposes, at agreed information delivery milestone, a wall in a project can be made up of a structural element, architectural cladding and air duct penetration with air duct passing through penetration. Mechanical, electrical and plumbing engineers are responsible to provide reliable information concerning sizing of duct and associated desired penetration sizing so that structural and architectural teams can continue to validate wall structure and cladding design.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - objects

In specifying the Level of Information Need, the objects within a breakdown structure for the information delivery shall be considered.

The Level of Information Need does not specify the objects within a breakdown structure.

To specify the Level of Information Need, the considered objects within breakdown structure should be specified, identifying the semantic, functional and/or spatial decomposition of the project into objects
(spaces and construction elements are identified)
or any other breakdown structure.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - objects

Based on the purpose, the Level of Information Need is **related to (WHAT)** :

- **Construction results** (spaces, construction complexes, construction entities and construction elements)
- **Construction information** (information model, building model, specification, documentation, diagram)

Breakdown structures can follow a classification system, systems engineering principles or a federation strategy.

Different purposes can require different breakdown structures and processed decompositions.

To fullfil the purpose of cost estimation during construction phase, breakdown structure can be different from breakdown structure required for scheduling.

- **BUILDING** Building information modelling -
- **INFORMATION** **Level of information need** -
- **MODELling** Concepts and principles

ISO 7817 **Terms and definitions**

3.11 **information** = meaningful data

3.12 **geometrical** information = information expressed using geometry

3.10 **geometry** = shape, size, and location of an object

3. 9 **object** = any part of the perceivable or conceivable world

3.13 **alphanumerical** information = information expressed using characters, digits and symbols or tokens

3.14 **documentation** = collection of documents related to a given subject

---

3. 4 information **model** = set of structured and unstructured information containers

3. 1 information **container** = named persistent set of information retrievable from within a file, system or application storage hierarchy

3.15 information **deliverable** = information container used to full-fil an appointment

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - prerequisities &

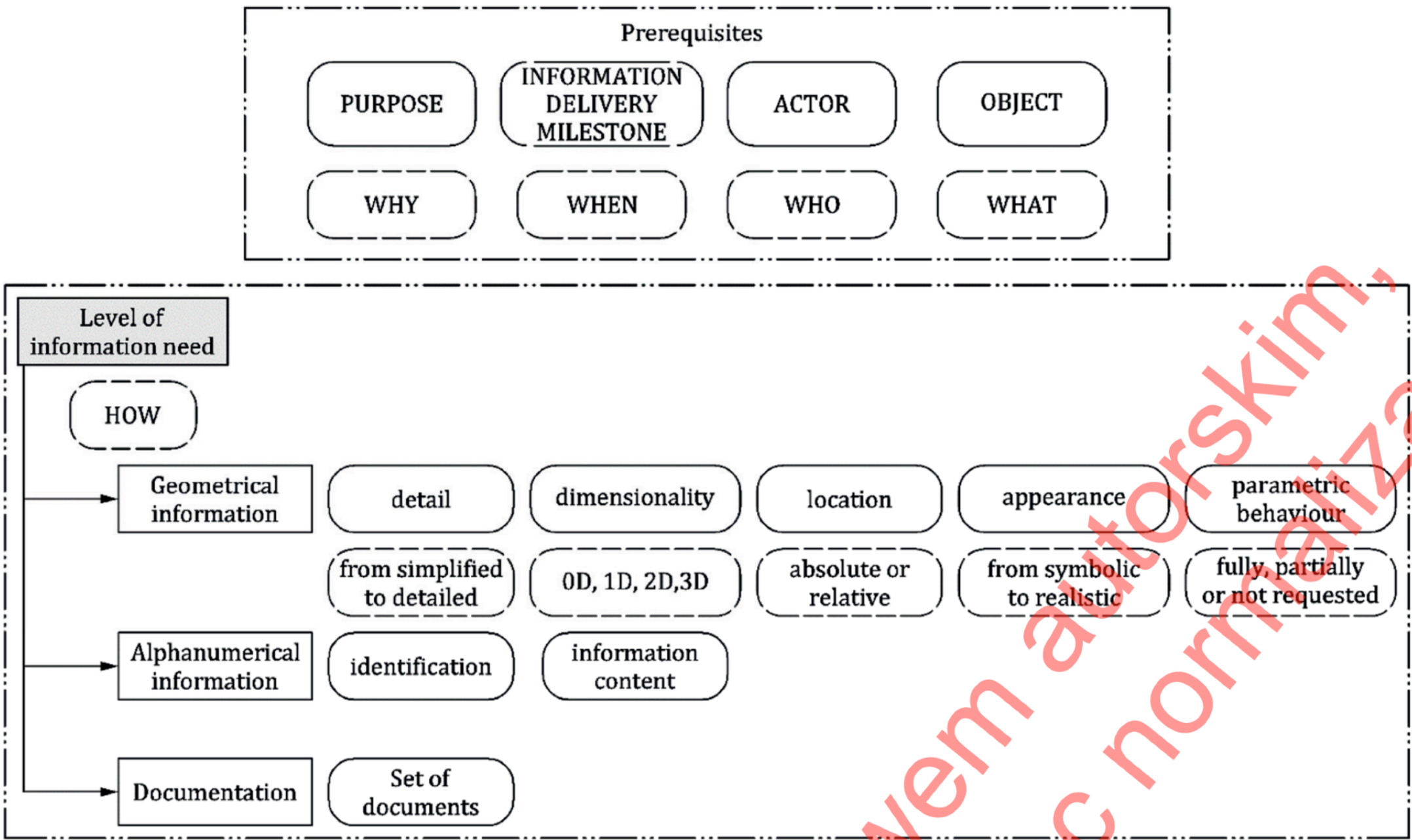


Figure 8 — Relationship diagram on level of information need

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rac normaliza

- **BUILDING** Building information modelling —
- **INFORMATION** **Level of information need** —
- **MODELling** Concepts and principles —

ISO 7817.2:2023(E)

INFORMATION **STRUCTURE**

GEOMETRICAL	ALPHANUMERICAL	DOCUMENTATION
detail	identification	reoports
dimesionality	content	specifications
location		manuals
appearance		photographs
parametric behav		hand-draw
		signed
		hard copies

- BUILDING
- INFORMATION
- MODELling

INFORMATION	STRUCTURE	
GEOMETRICAL	ALPHANUMERICAL	DOCUMENTATION
detail	identification	reoports
dimesionality	content	specifications
location		manuals
appearance		photographs
parametric behav		hand-draw
		signed
		hard copies

2D / 3D

detail

content

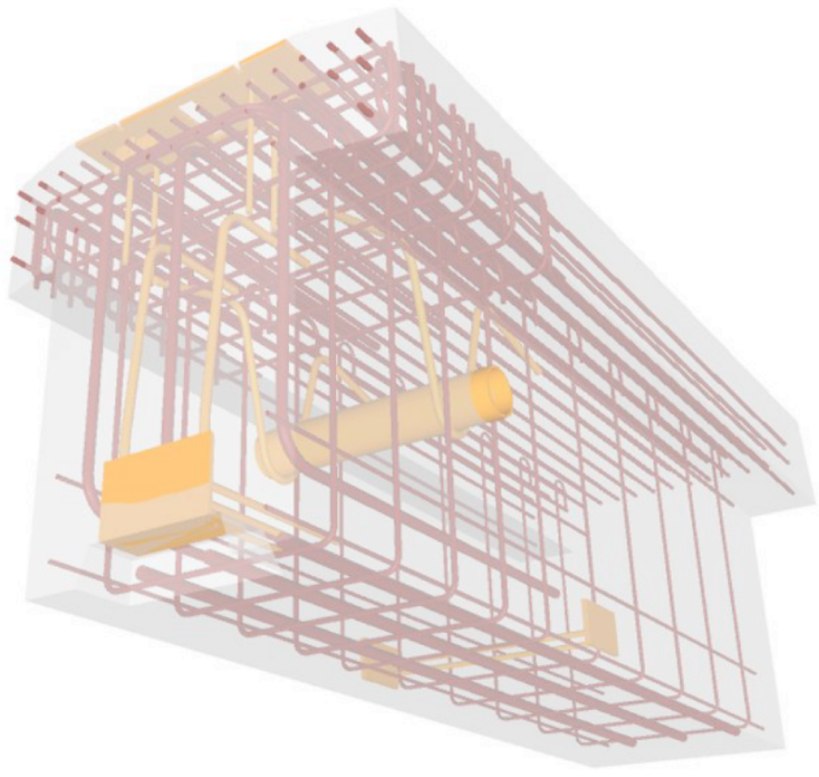
location

appearance

parametric behav

INFORMATION STRUCTURE

GEOMETRICAL



INFORMATION STRUCTURE

2D/3D GEOMETRICAL DETAIL

- an aspect describes the complexity
  of geometry compared to the real-world object

- a continuum ranging from simplified to detailed

- more refined geometric representations can contain
  more features, and/or be more decomposed,
  thereby being a better approximation
  of the shape of the real-world object

INFORMATION STRUCTURE

2D/3D GEOMETRICAL DETAIL

Detail of the door can be different, depending

- on the required purpose
- on information delivery milestones
- on appointing and appointed parties
- on objects within a breakdown structure

concept design simple detail of the door can be represented

(A) as **hole in the wall** to support structural analysis

standard design simple the door can be represented

(B) as **box** representing the door panel
for asset and facility management during operation

enhanced design detail adds the different components,

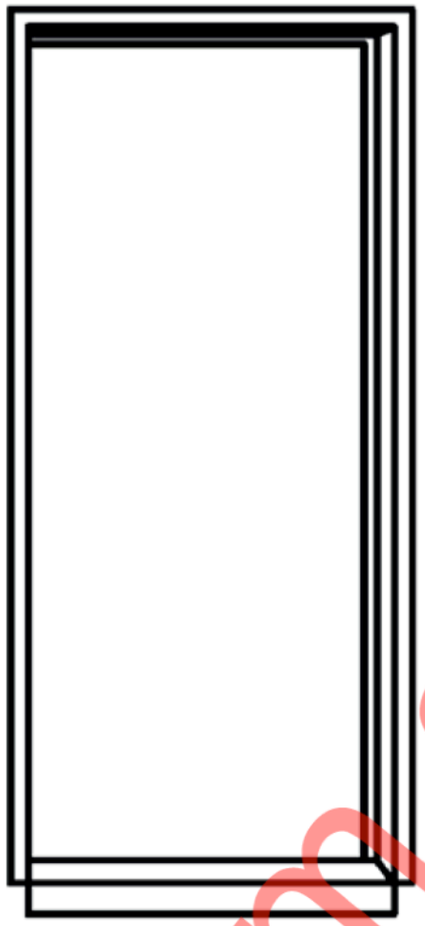
(C) as **threshold and casing** for clash detection

artistic and rendered design door can be represented

(D) as **handle and glazing** for visualization

INFORMATION STRUCTURE

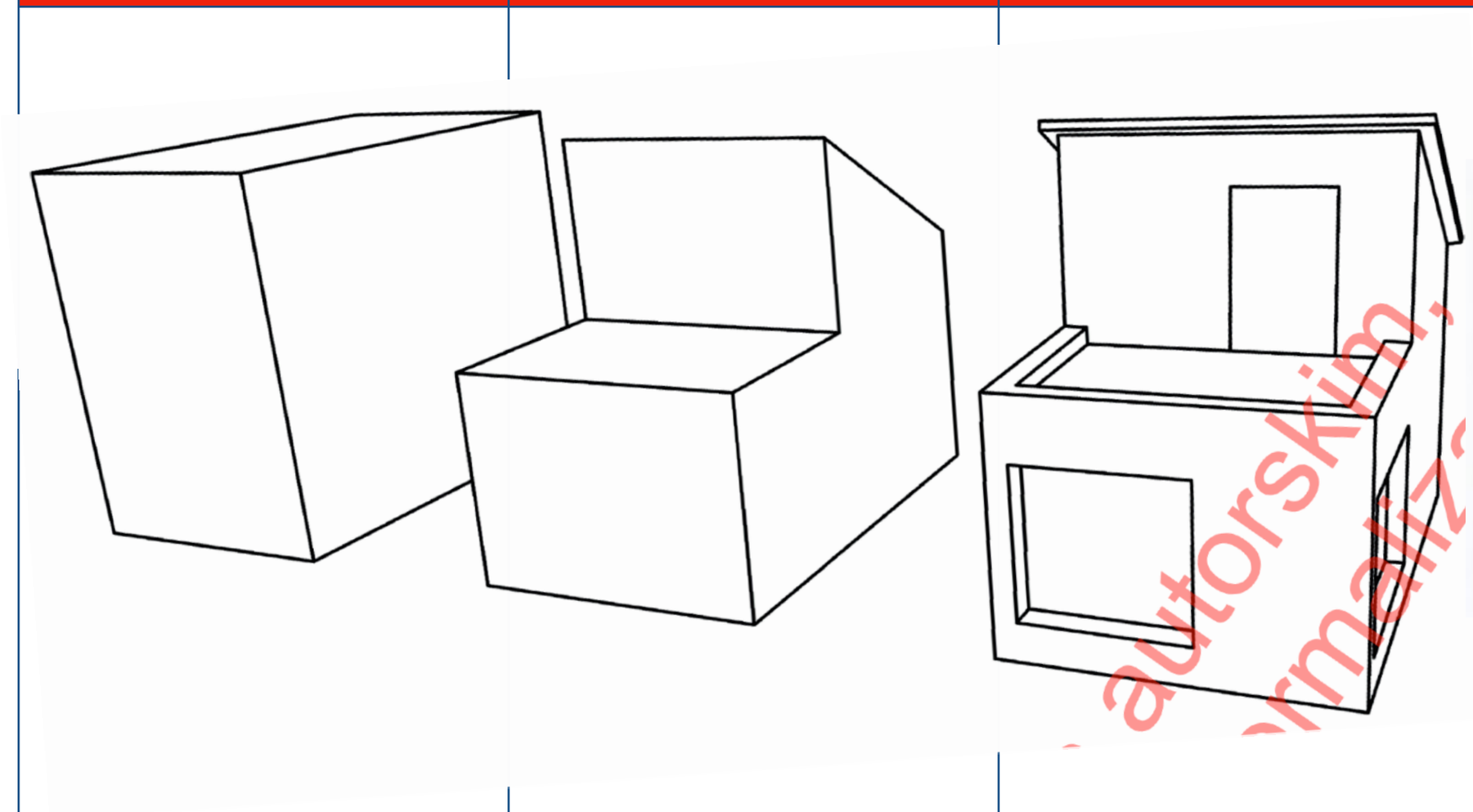
2D/3D GEOMETRICAL DETAIL

A	B	C	D
concept	standard	enhanced	rendered
hole	box	threshold	handle
			

INFORMATION STRUCTURE

2D/3D GEOMETRICAL DETAIL

A	B	C	D
brief	concet	standard	rendered
cube	roof	doors	texture



INFORMATION STRUCTURE

2D/3D GEOMETRICAL DIMENSIONALITY

A number of spatial dimensions characterize the object:

zero-dimensional — 0D (location point)
one-dimensional — 1D (line, curve, path)
two-dimensional — 2D (surface, face)
three-dimensional — 3D (body, volume)

quantity take off purpose
dimensionality of a pipe 1D pipe axis length
clash detection purpose
dimensionality of a pipe 3D body object
parcel management
dimensionality of a road 2D surface object area
dimensionality of a road 3D ground substrate volume
furniture planning
dimensionality of a bed 2D plane object
for accessibility analysis 3D body object

INFORMATION STRUCTURE

2D/3D GEOMETRICAL LOCATION

Location describes the **position** and **orientation** of an object.

Location is **absolute**,

against reference point,
absolute location of an object can be expressed
by its position and orientation in **reference system**
based on grids, alignment or reference point
(survey point in a coordinate reference system)

Location is **relative**,

relative location of an object against another object,
position and orientation in terms of **topological relationships**

INFORMATION STRUCTURE

2D/3D GEOMETRICAL APPEARANCE

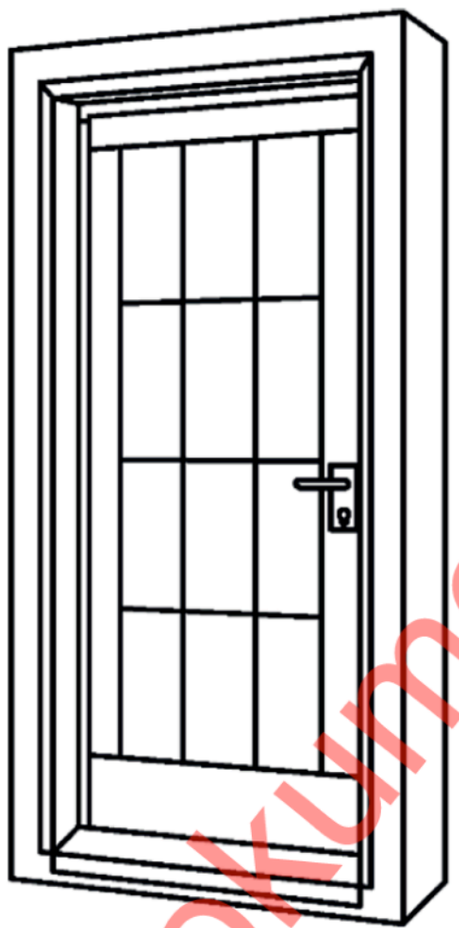
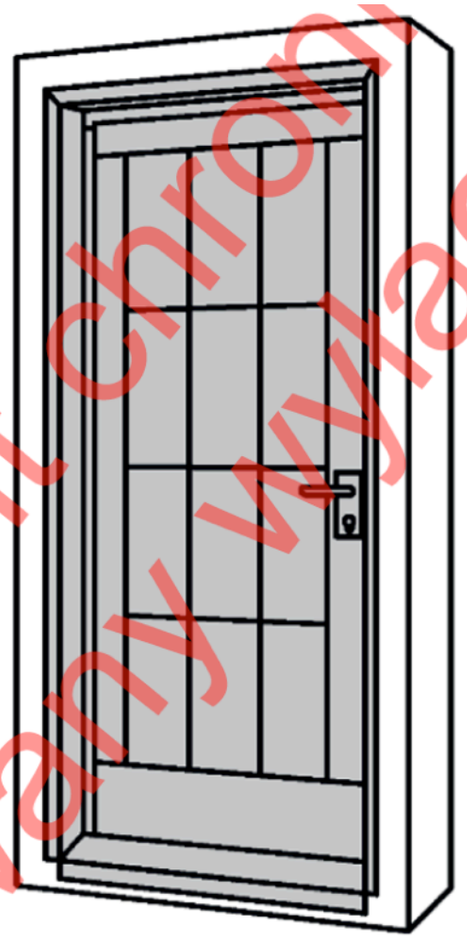
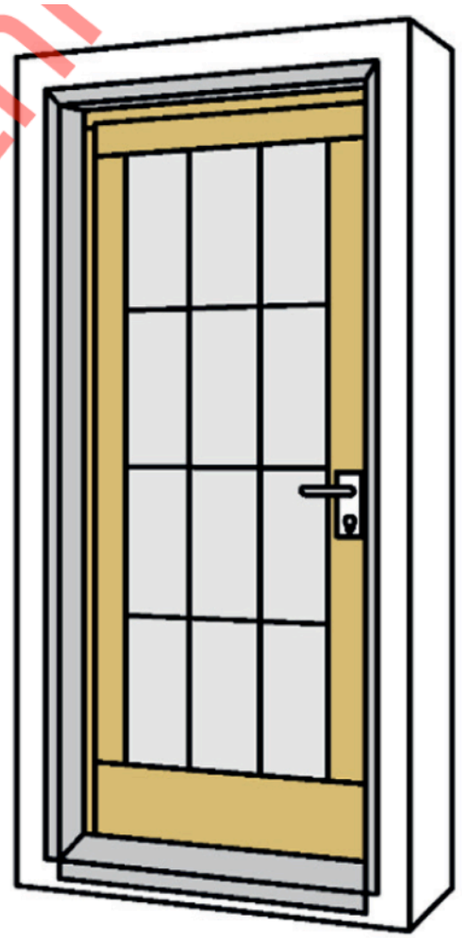
Appearance describes the visual representation of an object.

- a continuum ranging from symbolic to realistic compared to the real-world object.

- more refined appearance can contain shading attributes (diffuse color, transparency, reflectance, emissivity), being a better approximation of the visual characteristic of the real world object.

INFORMATION STRUCTURE

2D/3D GEOMETRICAL APPEARANCE

A	B	C	D
concept	standard	enhanced	rendered
no color	single color	material color	textures
			

dokument chroniony
wany wyłącznie

INFORMATION STRUCTURE

2D/3D GEOMETRICAL PARAMETRIC BEHAVIOUR

describes whether or not the **shape, position and orientation** is created or to the context, into which the object is placed, allowing full or partial re

geometry types can allow parametric behaviors to a certain degree:

— **explicit geometry** — definition of shape as boundary representations (vertices, edges and faces) with no modification of the shape by other parameter

— **constructive geometry** — definition of shape as constructive solid geometry based on geometric primitives and swept solids that allow for modification of the shape by shape parameters;

— **parametric geometry** — definition of a singular shape or an assembly of shapes by equations that provide values for the shape parameters allowing for shape modifications based on object or context

object can be transferred as part of the **information delivery** or not.
in the context of information exchange,
parametric behavior can be **fully**, **partially** or **not requested**.

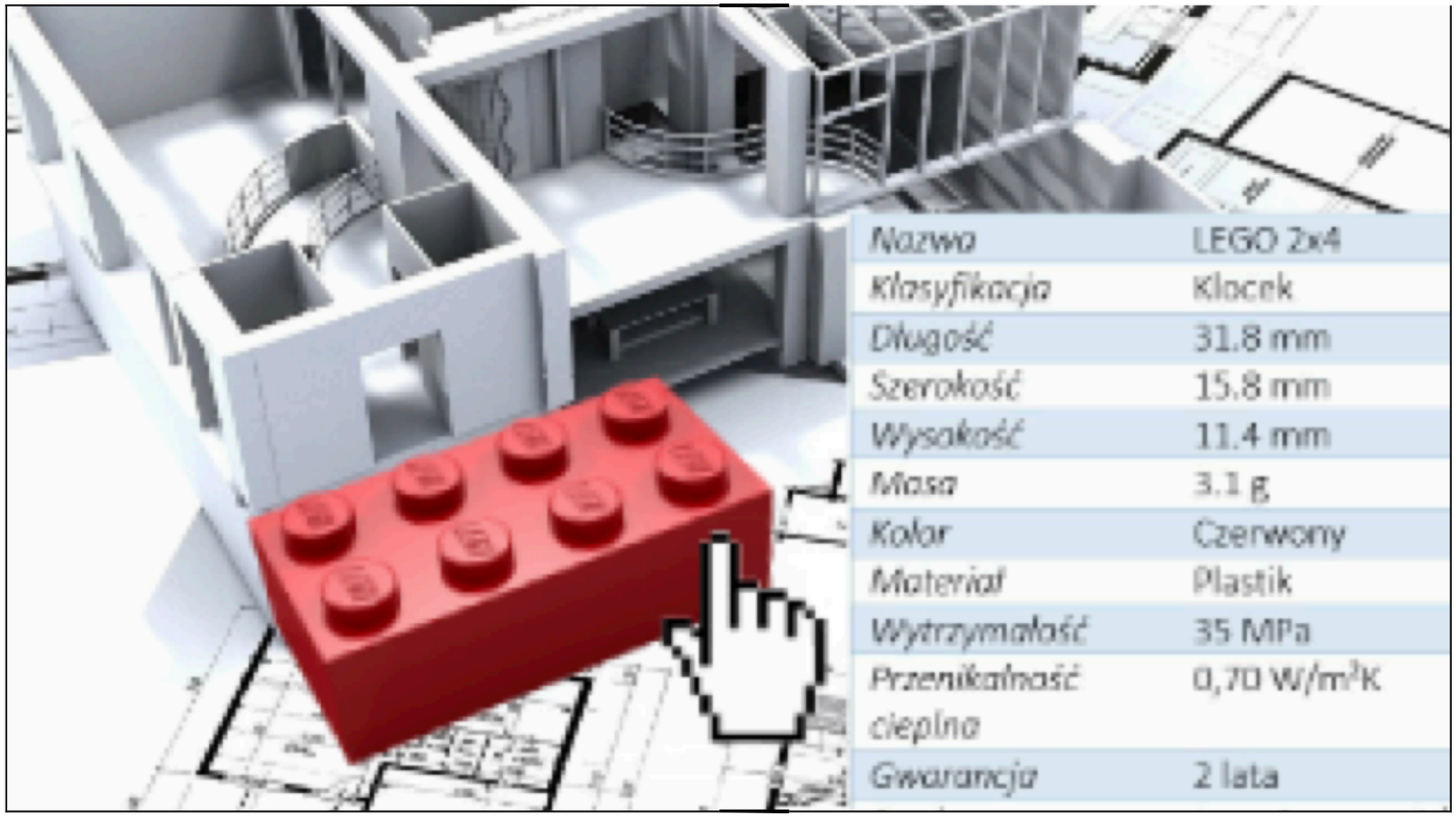
- **BUILDING**
- **INFORMATION**
- **MODELling**

INFORMATION STRUCTURE		
GEOMETRICAL	ALPHANUMERICAL	DOCUMENTATION
detail	identification	reports
dimesionality	content	specifications
location		manuals
appereance		photographs
parametric behav		hand-draw
		signed
		hard copies

A-Z / 1-100

identification

content



INFORMATION STRUCTURE

A-Z / 1-100 ALPHANUMERICAL IDENTIFICATION

position an **object** within a breakdown **structure**

- **name,**
- **type name,**
- **classification,**
- **codification,**
- **reference structuring,**
- **index,**
- **numbering,**
- **……..**

INFORMATION STRUCTURE

A-Z / 1-100 ALPHANUMERICAL CONTENT

Properties can be grouped to facilitate information management

1 concept design could specify a presence of only objects identified as external walls and an information containing
- name of the type classification
- property load bearing indicating if the object is

2 standard design based on the chosen breakdown structure for
- all objects with common type
- sets of objects with similar properties
- objects based on individual types

3 quantity take-off for all objects can include
- type name code breakdown structure
- volume or area used to identify objects with a specific purpose

4 cost estimation of the structure for
- only retained objects with property load bearing

5 final handover for operational purpose specify a presence of
- all objects identified as requiring maintenance.

6 operation extensive content product, manufacturer and warranty

- BUILDING
- INFORMATION
- MODELling

DOCS

reports

specifications

manuals

photographs

hand-draw

signed

hard copies

INFORMATION STRUCTURE		
GEOMETRICAL	ALPHANUMERICAL	DOCUMENTATION
create	order	reports
generate	transmit	specifications
deliver	exchange	manuals
specify	process	photographs
model	present	hand-draw
read	manage	signed
versione	modify	hard copies

INFORMATION STRUCTURE

DOCUMENTATION

INFORMATION STRUCTURE

GEOMETRIC ALPHANUMERIC DOCUMENTATION

DOCS

reports

specifications

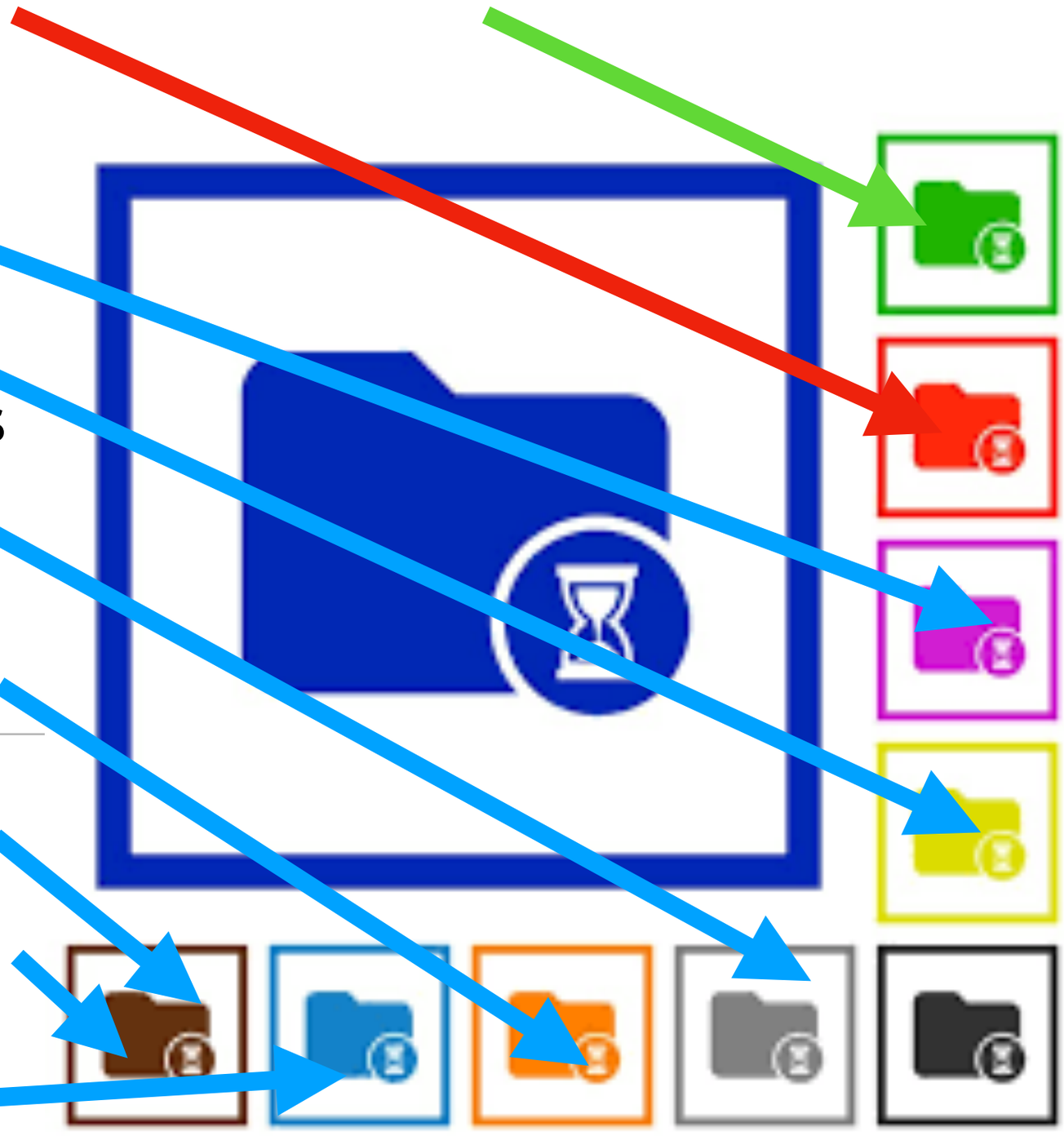
manuals

photographs

hand-draw

signed

hard copies



BIG DATA

DATA BASE

CONTAINER

CATALOG

FILE

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - prerequisities &

GEOMETRICAL , ALPHANUMERICAL , DOCUMENTATION
can be processed from each other

Geometrical information can be processed from
Alphanumerical information
create BIM model objects from numerical data

Alphanumerical information can be processed from
Geometrical information
dimensions and distances between objects

Documentation (photo, video) can be processed from
Geometrical information
views copied, extracted and recorded from BIM model

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - prerequisities &

GEOMETRICAL , ALPHANUMERICAL , DOCUMENTATION
can be derived from each other

The nominal width of a road as alphanumerical information can steer the generation of the geometrical representation of the road.

Documentation can be derived from alphanumerical information.

Schedules extracted from an information model and recorded as an external document.

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - prerequisities &

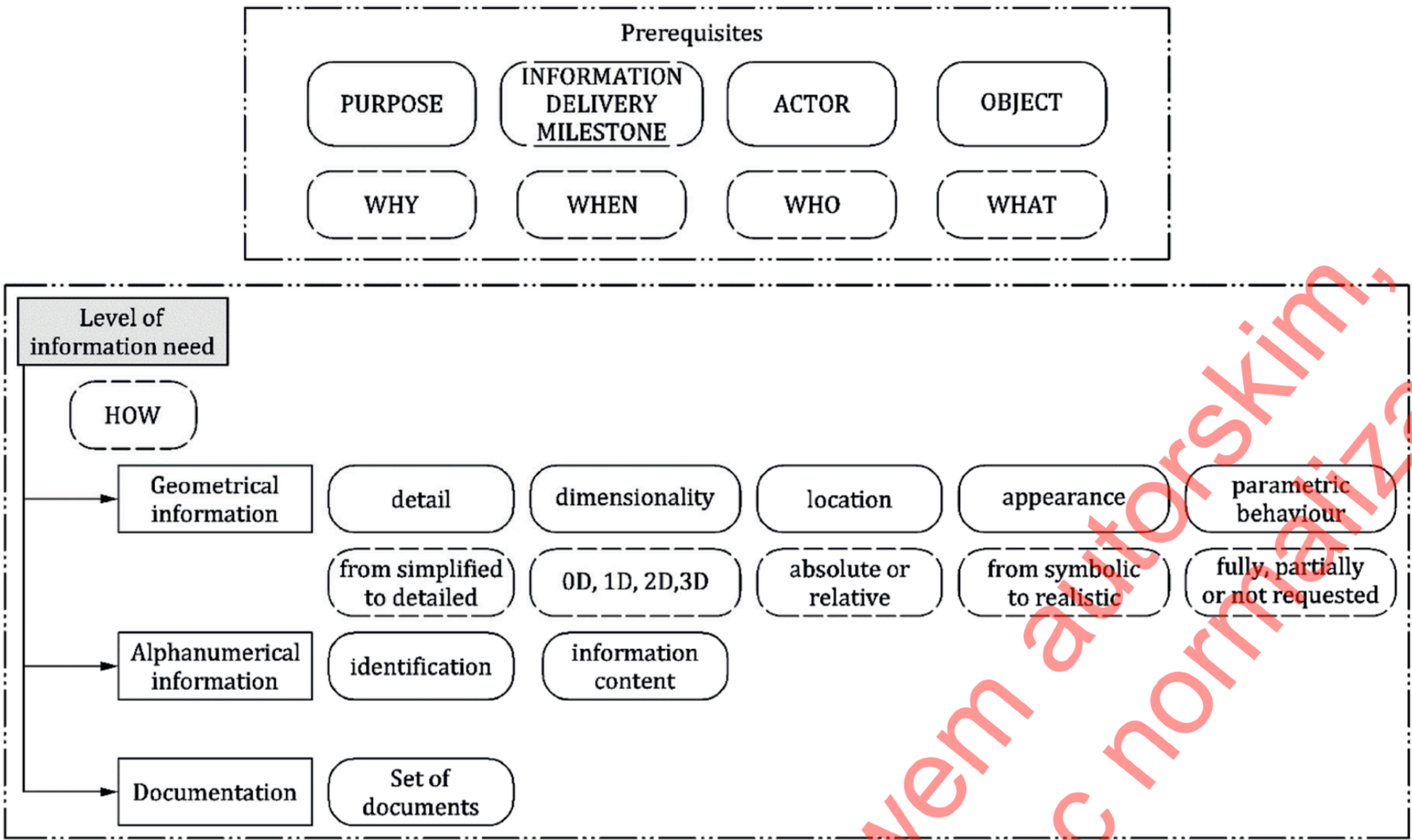


Figure 8 — Relationship diagram on level of information need

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INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - WALL example prerequisities

To enable the visualization of the preliminary design works, the surveyor provides the following information relating to the **WALL** to the designer using classification:

ISO 16739, ISO 81346-12, Omniclass, Uniclass, CoClass, CCI.

Level of Information Need (**HOW**)

— Geometrical information:	requested
◆ (detail)	requested
◆ (dimensionality)	requested
◆ (location)	requested
◆ (appearance)	requested
◆ (parametric behaviour)	**not requested**
— Alphanumerical information:	requested
◆ (identification)	requested
◆ (content)	requested
— Documentation:	not requested
◆ (set of documents)	**not requested**

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - WALL example prerequisities

To enable the visualization of the preliminary design works, the surveyor provides the following information relating to the **WALL** to the designer using classification:
ISO 16739, ISO 81346-12, Omniclass, Uniclass, CoClass, CCI.

Level of Information Need (HOW)

- Geometrical information:
  - (detail) volume with openings
  - (dimensionality) 3D space
  - (location) absolute reference
  - (appearance) realistic with texture of materials
  - (parametric behaviour) not requested
- Alphanumerical information:
  - (identification) wall type
  - (content) type, name, property
- Documentation:
  - (set of documents) not requested

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - blank prerequisities

Prerequisites						Level of information need		
Why	When	Who		What		How		
Purpose	Information delivery milestone	Actor (Requesting)	Actor (Delivering)	Object	Breakdown structure			
						Geometrical information	Detail	
							Dimensionality	
							Location	
							Appearance	
							Parametric behaviour	
						Alphanumerical information	Identification	
							Information content	
						Documentation	Set of documents	

Dokument chroniony
Korzystywanie wyłącznie

Figure B.3 — Example1 blank table

INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - WALL example

Prerequisites						Level of information need		
Why	When	Who		What		How		
Purpose	Information delivery milestone	Actor (Requesting)	Actor (Delivering)	Object	Breakdown structure			
Visualization	Preliminary Design	Lead appointed party - Designer	Surveyor	Wall	Classification	Geometrical information	Detail	Simplified volume representation including openings
							Dimensionality	3D
							Location	Absolute
							Appearance	Realistic with texture of materials
							Parametric behaviour	Not requested
						Alphanumerical information	Identification	Wall type
							Information content	Type, ...
						Documentation	Set of documents	Not requested

Figure B.4 — Example1 populated table for "wall" object

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INFORMATION STRUCTURE

LEVEL of INFORMATION NEED - verification and validation

Concepts and principles of ISO 7817-2: 2023(E) standard allows the verification that specifying Level of Information Need has been fulfilled, conforming the prerequisites and its incorporation in the Exchange Information Requirements (EIR) and Information Delivery Plan (IDP).

Verification and validation can be performed when an information deliverable has been provided according to specified Level of Information Need, Exchange Information Requirements and its associated acceptance criteria. Level of Information Need should be specified in a way to allow both manual and machine interpretable verification and validation processes and/or schemas. Machine interpretable specification of Level of Information Need reduces time and human errors, when verifying and validating information deliverables.

Level of Information Need should be specified in a clear and unambiguous way to avoid any kind of different interpretation of the same requirement. Verification of information deliverables against the Level of Information Need can support checking the presence of objects (building, space, door), geometrical information (location, dimensionality), alphanumerical information (fire resistance, expected life, exposition class), documentation (building permit, manuals, warranties).

The verification of an information deliverable can check the presence of the fire resistance property for each object that requires such a check (fire door). Validation of information deliverables against the Level of Information Need ensures that the provided geometrical information, alphanumerical information and documentation can be used for the purpose they have been specified for.

The validation of an information deliverable can check that the value of the fire resistance property is a time based value or similar according to national legislations. Reliability and tolerance can be added to geometrical information, alphanumerical information and documentation.
Completeness of verification criteria is included within ISO 19650-4:2022, term 7.6.

B I M

acronym

three different, but related functions

Official definition presented by

BuildingSMART International

January 31, 2012

DEFINICJE BIModell

is the DIGITAL REPRESENTATION of physical and functional characteristics of a facility.
As such it serves as a shared knowledge resource for **information** about a facility, forming a reliable basis for decisions during its life-cycle from inception onwards.

jest to CYFROWY OPIS fizycznych i funkcjonalnych właściwości budowli, służący jako źródło wiedzy i wszelkich **informacji budowlanych**, dostępny dla uczestników procesu inwestycyjnego i stanowiący niezawodną podstawę dla podejmowania decyzji w trakcie cyklu życia, od koncepcji do rozbiórki budynku.

DEFINICJE BIModelling

is a BUSINESS PROCESS for generating and leveraging building **data** to design, construct and operate the building during its lifecycle. BIM allows all stakeholders to have access to the same **information** at the same time through interoperability between technology platforms.

jest to PROCES TWÓRCZY generowania i wykorzystania **danych** o obiekcie budowlanym, jego projektowaniu, budowie i eksploatacji w trakcie pełnego cyklu życia. BIM pozwala, aby wszyscy zainteresowani uczestnicy inwestycji mieli dostęp do tych samych **informacji**, w tym samym czasie, przez interoperacyjność platform technologicznych.

DEFINICJE BIManagement

is the ORGANIZATION and CONTROL of the business process by the utilizing of **information** in the digital prototype to effect the sharing of **information** over the entire lifecycle of an asset. The benefits include centralized and visual communication, early exploration of options, sustainability, efficient design, integration of disciplines, site control, as built documentation, effectively developing an asset lifecycle process and model from conception to final retirement.

DEFINICJE BIManagement

jest to ORGANIZACJA i KONTROLA procesów inwestycyjnych poprzez wykorzystanie parametrów cyfrowego modelu budynku dla dokonywania wymiany informacji o składnikach aktywów w całym cyklu życia. Korzyści wynikają z scentralizowanej i wizualnej komunikacji poprzez obiekty trójwymiarowe, wczesnego rozpoznania możliwości, ze zrównoważonego i efektywnego, interdyscyplinarnego i interaktywnego projektowania, kontroli w trakcie i na miejscu budowy, aktualizacji dokumentacji do stanu rzeczywistego (zmiany projektowe, podczas budowy oraz w trakcie eksploatacji), efektywnego rozwoju aktywów i modelu cyfrowego w cyklu życia od koncepcji do rozbiórki budynku.

BUILDING INFORMATION MODELLING

MODELOWANIE DANYCH BUDOWLANYCH

Questions please

Introduction to Building Informati elling

ISO 7817-2: 2023 (E)

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