

REVIT - AUTOMATE TO CONQUER

OVERCOMING
ARCHITECTURAL
PROJECT CHALLENGES

SPEAKER

TERESA AFONSO

11:50 AM . SEPT 7TH
DUBLIN . 2023



N L A



ABOUT NLA

Founded in Lisbon in 1980

National and International projects

Portugal . Angola . Brazil . Cape Verde . Colombia .
East Timor . Georgia . Germany . Italy . Paraguay .
Morocco . Mozambique . Oman . Saudi Arabia .
United Arab Emirates

Areas of Specialisation

Housing . Retail . Education . Public Spaces .
Corporate Buildings . Hotels and Leisure .
Sustainability . Urban Design . Interior Design

36 Collaborators in house



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BIM IN PORTUGUESE CONTEXT

LOW USE AND KNOWLEDGE

BOQ - ARCHITECTS RESPONSIBILITY

MUNICIPALITIES - NOT MANDATORY
(ABOUT TO CHANGE)



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INTRODUCTION

As an architectural firm, we are challenged daily to directly generate the necessary outputs using BIM software, throughout all the stages of a project.

Each office has its own needs and specific outputs. Software should be able to meet our needs, but sometimes that doesn't happen.

In that case, we must find a way to figure out how to make it work



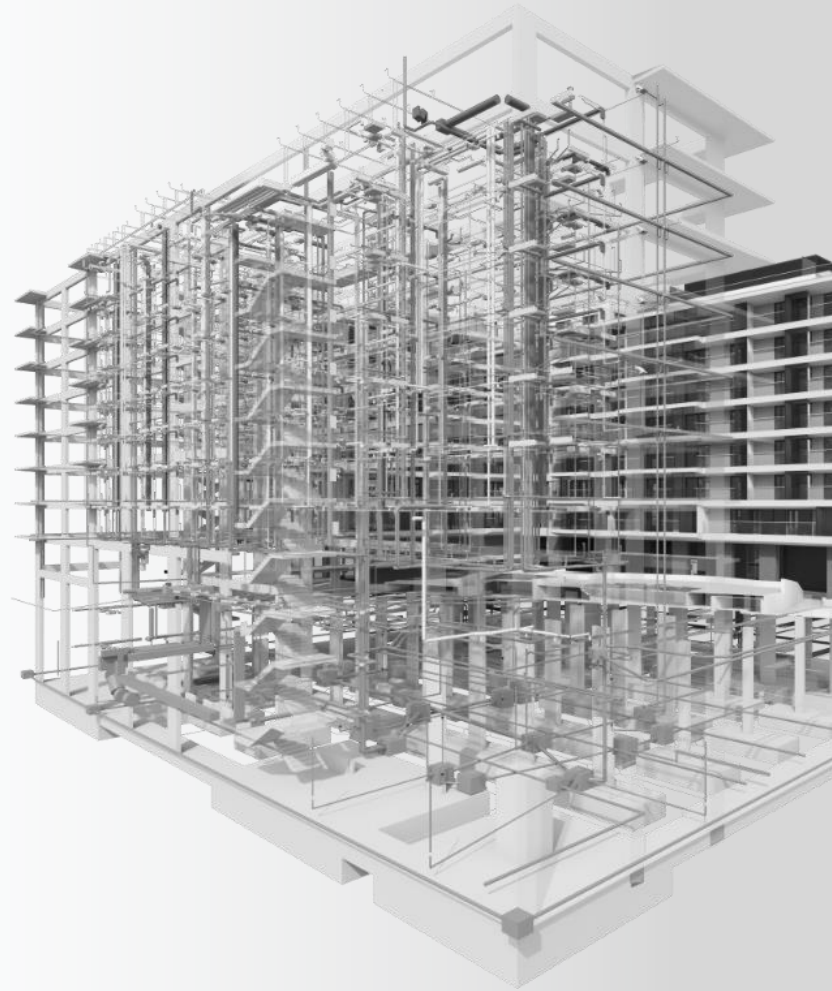
HANDS ON BIM

DESPITE OPEN BIM YOU NEED TO RELY
ON SPECIFIC SOFTWARE

EFFICIENT INTEROPERABILITY

OUT-SOURCING BIM MODELS IS NOT
BIM PROCESS

SOLVE DAY-TO-DAY ISSUES



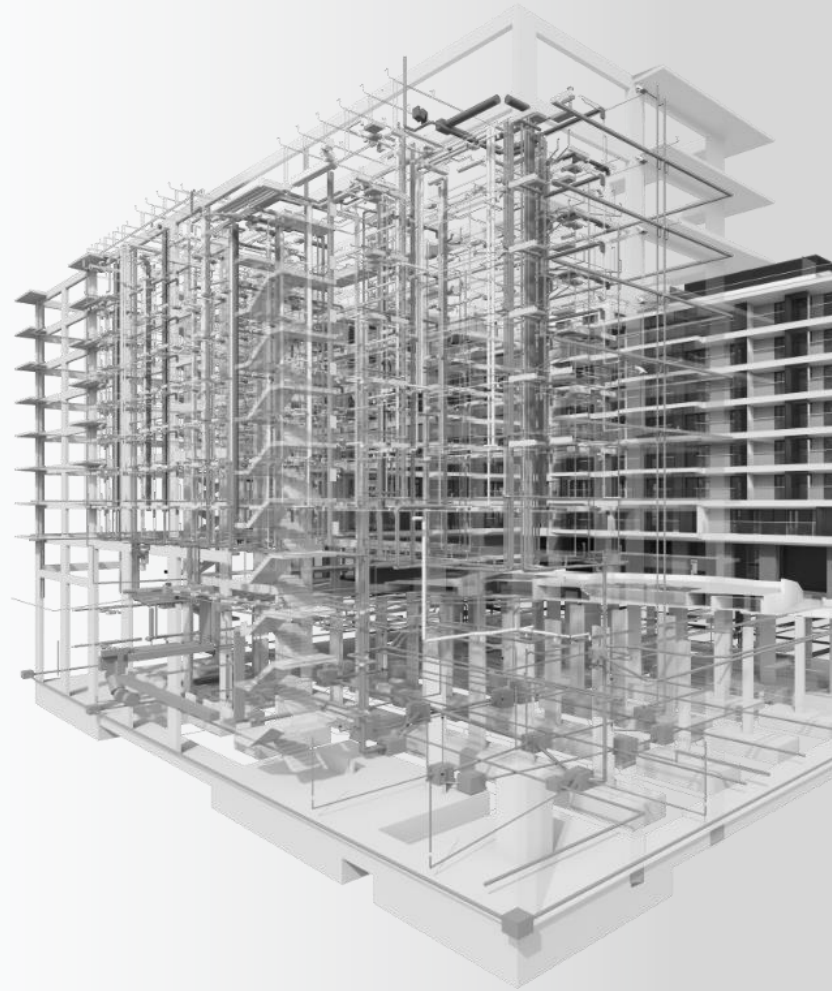
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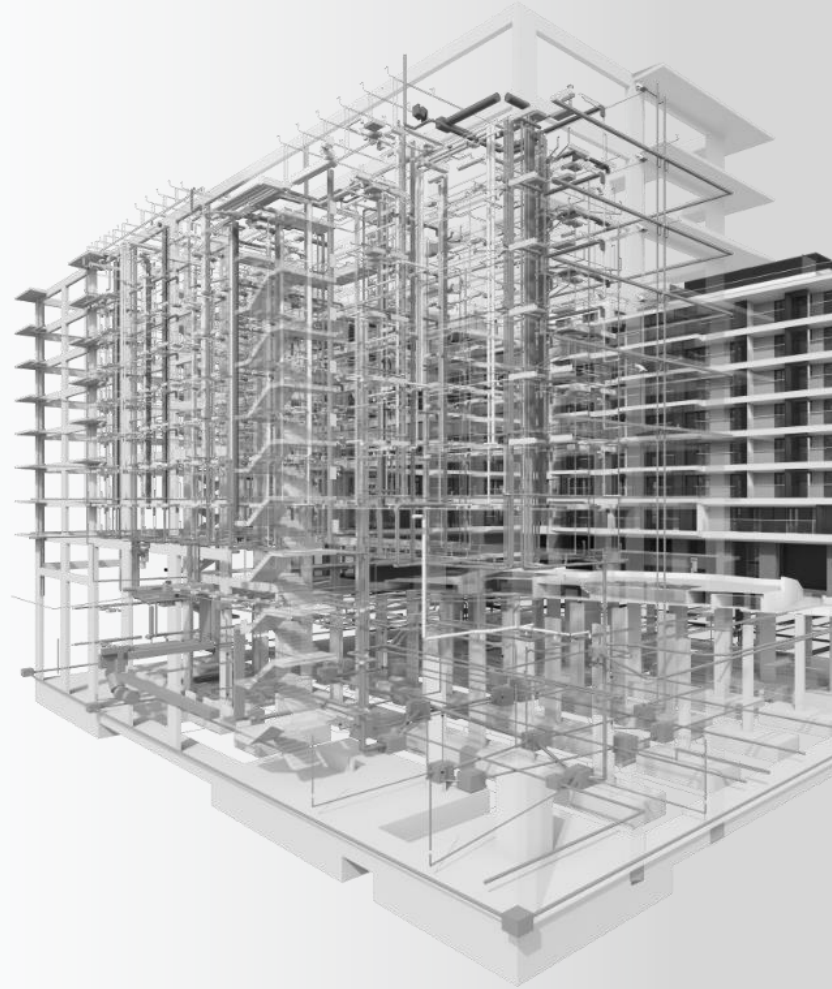
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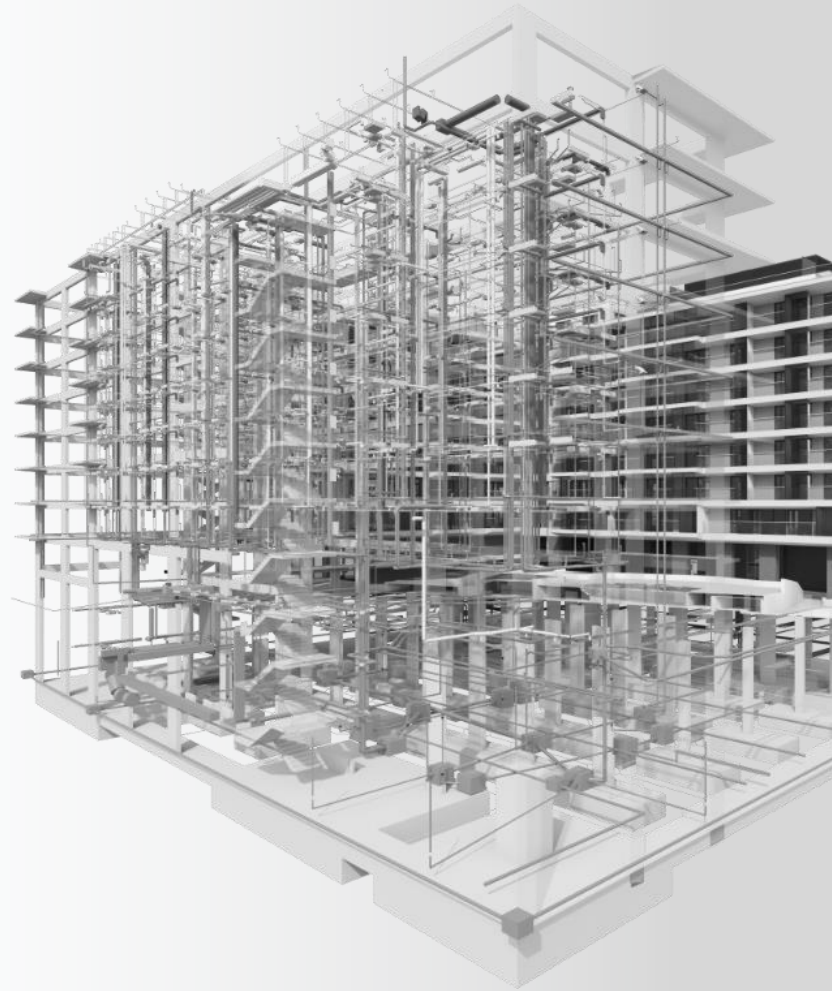
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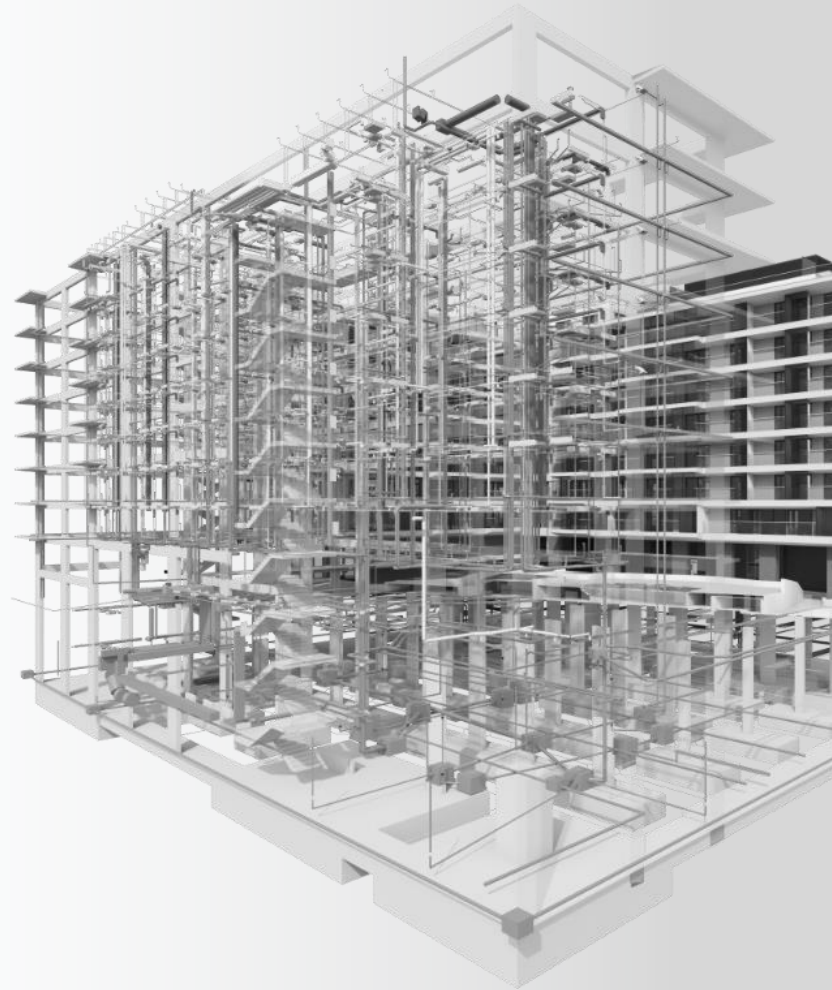
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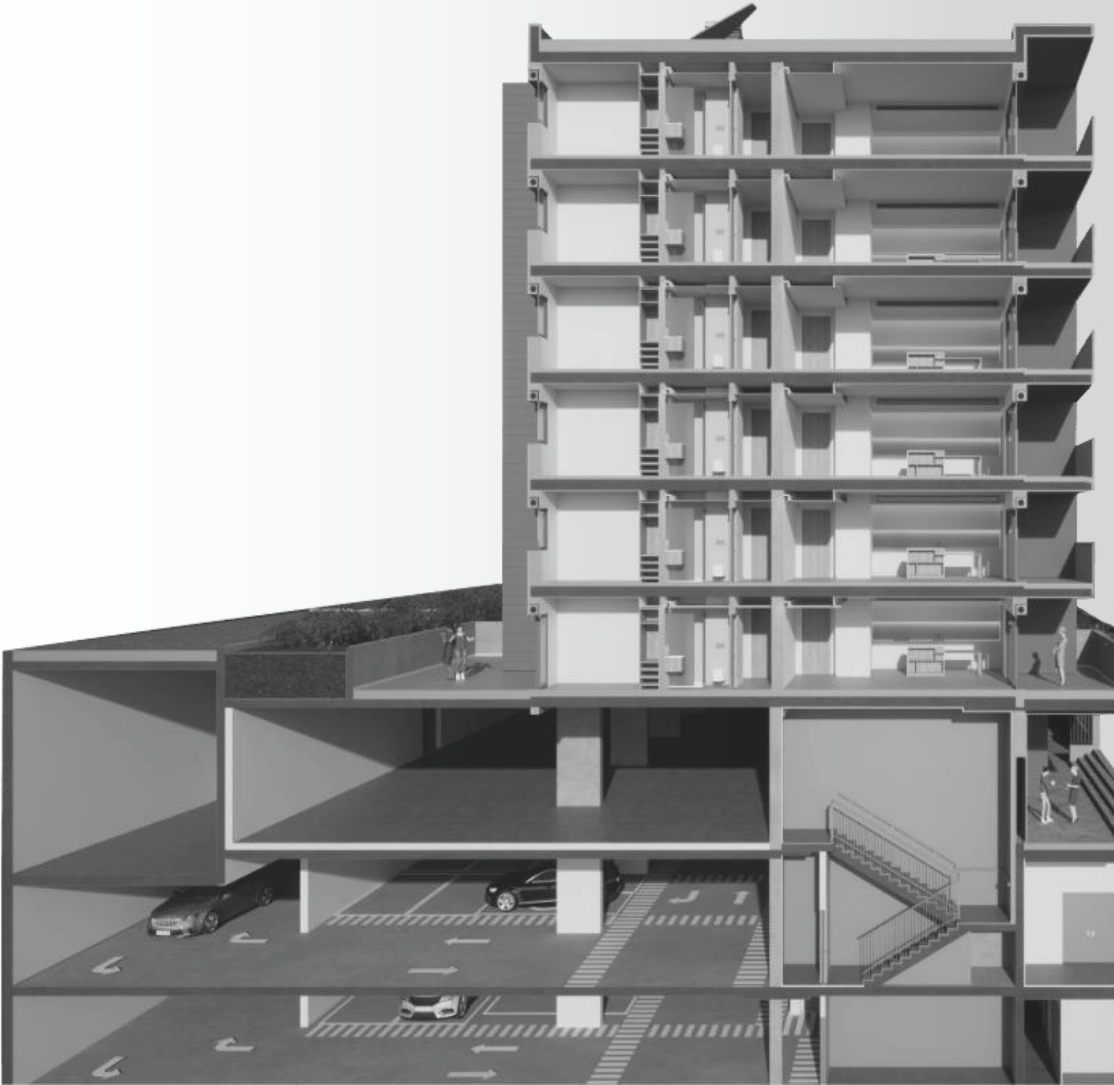
SOLVE DAY-TO-DAY ISSUES



CONQUER

LOIN OVER
LOD FROM
THE BEGINNING

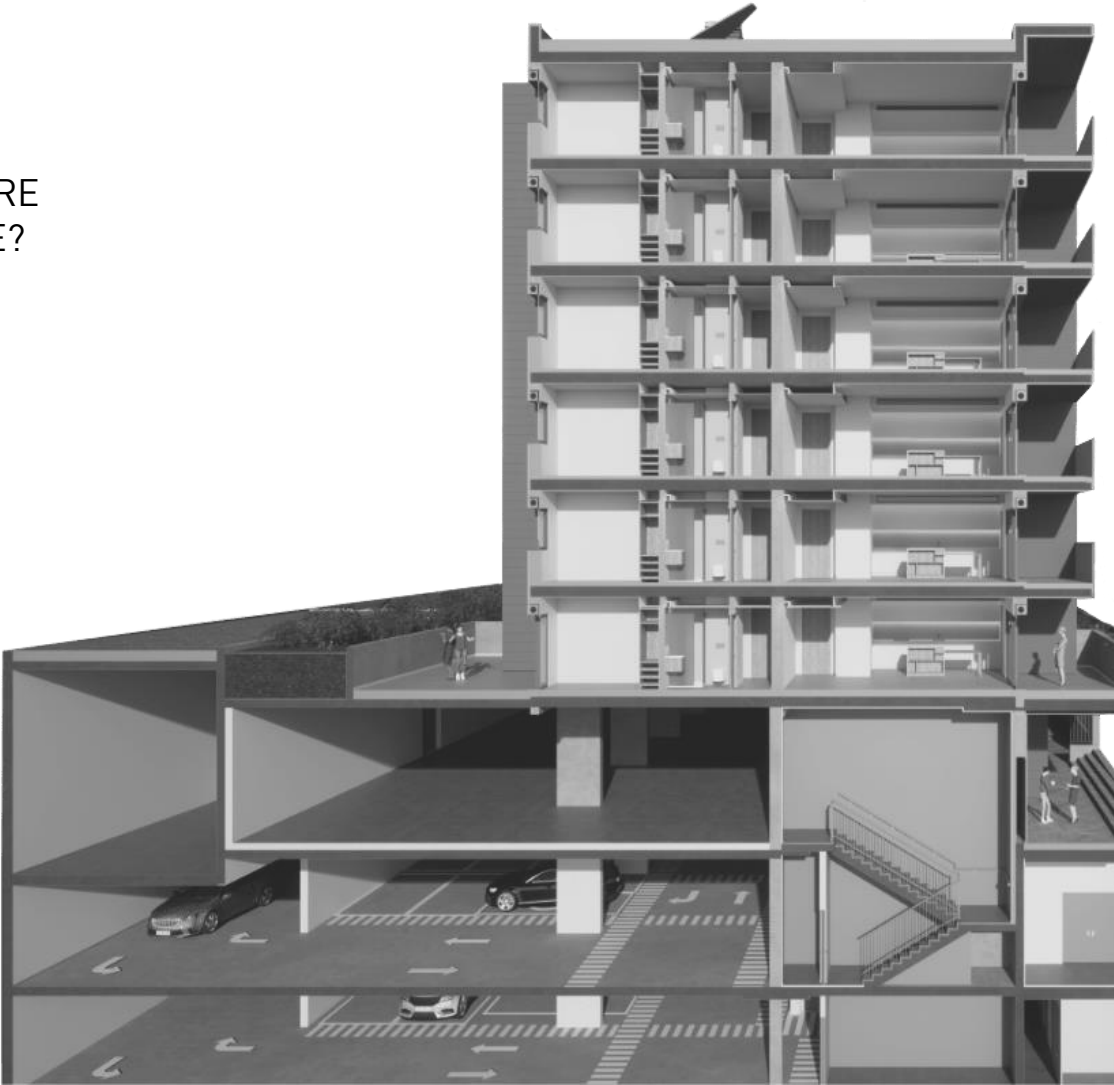
Level Of Information Needed



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CONQUER

CAN A SOFTWARE BIM SOFTWARE
BE EFFICIENT AND PROFITABLE?



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CONQUER

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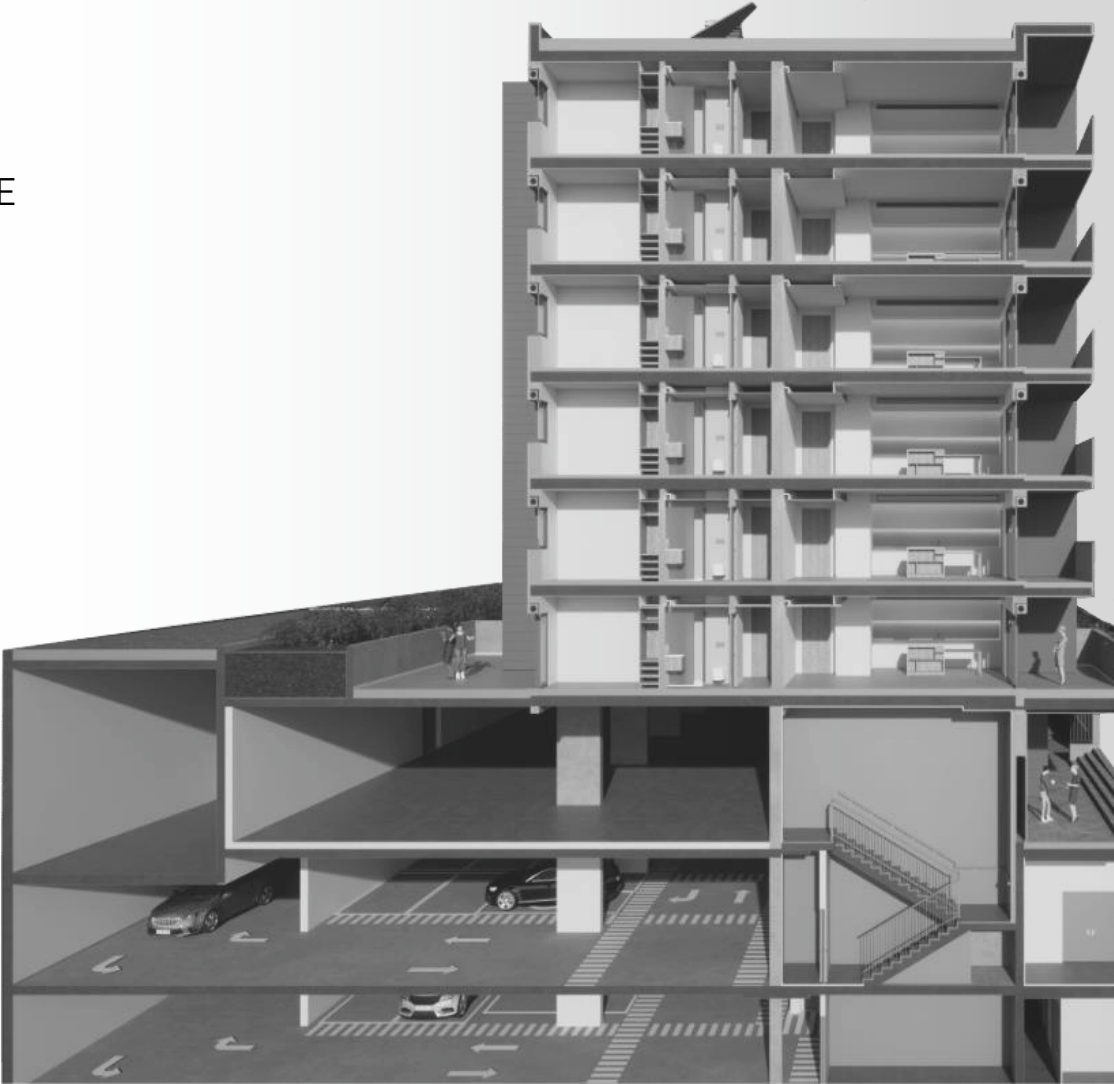
YES

If you have a well-trained and productive team,
templates
and processes defined with automated tasks.



CONQUER

IS ONE SOFTWARE ABLE TO GIVE ALL THE OUTPUT NEEDED?



CONQUER

IS ONE SOFTWARE ABLE TO GIVE ALL THE OUTPUT NEEDED?

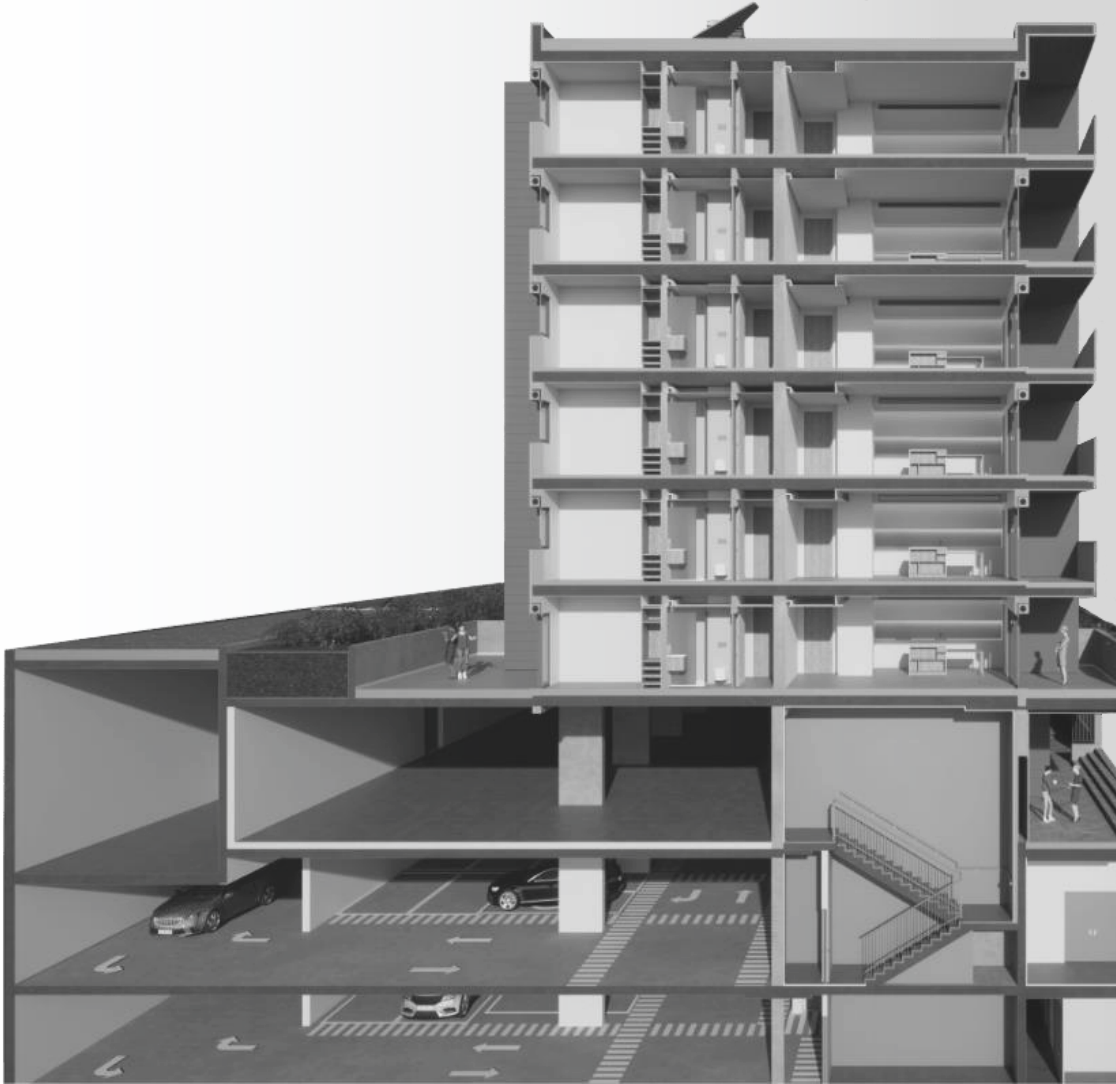
NO

Sometimes, it isn't enough to do what we need to reach a project's requirement and countries' specific regulations.



CONQUER

HOW TO
SOLVE THIS?



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CONQUER

HOW TO
SOLVE THIS?

AUTOMATION

Organizing data and programming according to your needs!



EFFICIENCY

HUMAN RESOURCES

Good leadership.
Motivated teams.
Regular training.
Teams adjusted to work volume.

HARDWARE

Appropriate workstations.
Equipment like mice, monitors & chairs are also important.

SOFTWARE

Appropriate and legal software.
Enough number of licences for all teams.

STANDARD & PROCEDURES

Very important to define rules, making sure everyone is working in the same direction.

AUTOMATION

Last but not least, to reach the best efficiency, you will need to automate processes.

AUTOMATION

Default Documents

Groups

Standardize Procedures

Shared Parameters

Titleblocks

Default Details

Families

Libraries

Customized Template

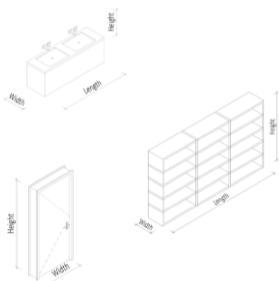
Programming

AUTOMATION

24.4. Elements of Construction

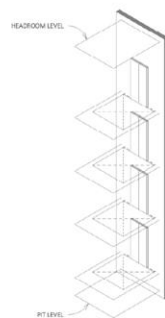
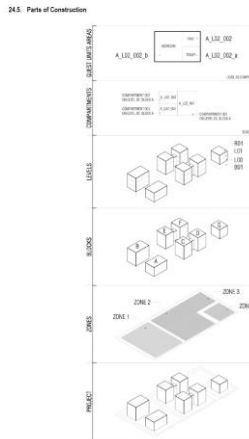
Structure - Primary Elements		
21.xx	External Walls	
22.xx	Internal Walls	
23.xx	Architectural Floors	23.01 - 23.49 Interior 23.50 - 23.xx Exterior
Structure - Secondary Elements		
31.xx	Sills, Thresholds & Roller shutters	31.01 - 31.49 Interior 31.50 - 31.xx Exterior
33.xx	Skirtings	33.01 - 33.49 Interior 33.50 - 33.xx Exterior
34.xx	Guardrail	34.01 - 34.49 Interior 34.50 - 34.xx Exterior
35.xx	Ceilings & Trapdoors	35.01 - 35.49 Interior 35.50 - 35.xx Exterior
36.xx	Ceiling Mouldings & Coves	36.01 - 36.49 Interior 36.50 - 36.xx Exterior
37.xx	Chimneys and Roof's Technical Areas	
38.xx	Stair Railings	38.01 - 38.49 Interior 38.50 - 38.xx Exterior
39.xx	Coping & Covering Sheets	
Finishes		
41.xx	External Wall Finish	
42.xx	Internal Wall Finish	
43.xx	Floor Finish	43.01 - 43.49 Interior 43.50 - 43.xx Exterior
44.xx	Star Finish	44.01 - 44.49 Interior 44.50 - 44.xx Exterior
45.xx	Ceiling Finish	45.01 - 45.49 Interior 45.50 - 45.xx Exterior
47.xx	Roof Finish	

Windows & Doors	
Cxx	Fire Protection
Mxx	Wood
Sxx	Metals/Pvc & Skylights
Vxx	Glass
CWxx	Curtain Wall
Pxx	Prufabricated
Other Façade Elements	
ZSxx	Drying areas
BSxx	Balcony's separation walls
Vertical Elements	
ESCxx	Stairs
EVxx	Elevators
Xxx	Shafts
Equipments	
EFxx	Fixed Equipment
ESxx	Sanitary Equipment
EKxx	Kitchen Equipment
Fxx	Furniture
Lxx	Lighting
Ax	Accessories
Dxx	Others
Materials Code (BIM only for bop purpose)	
ta.xx	Membrane
rm.xx	Insulations
er.xx	Plaster
pv.xx	Paint
ff.xx	Concrete Block Work
fg.xx	Ceramic Block Work



24.5. Parts of Construction

- 1) confirm you have the BCF Manager opened
- 2) select the elements you want to address
- 3) Click "Add New Issue"
- 4) add a praf number with 3 digits when editing the Title
- 5) Be careful choosing the type of Issue
- 6) Define the priority
- 7) assign the issue to a team or team member
- 8) choose a label to match the discipline



Type Properties

Family: NLA_LR_Central_IL
Type: Service_250X300X

Type Parameters	Parameter	Value
Construction	Function	Isolation
	Wall Closure	By host
Materials and Finishes	Material	By Category
	Frame Material	By Category
Dimensions	NLA_Level01_Height	3.0000
	NLA_Level02_Height	3.0000
	NLA_Level03_Height	3.0000
	NLA_Level04_Height	3.0000
	NLA_Door_Width	1.0000
	NLA_Door_Thickness	0.1000
	NLA_Frame_Thickness	0.1000
	NLA_Cabin_Width	2.0000
	NLA_Cabin_Length	2.0000
	NLA_Shelf_Width	2.5000
	NLA_Shelf_Length	3.0000
	NLA_PI_Height	1.0000
	NLA_Headroom_Height	4.0000
	NLA_Frame_Width	0.2000
	NLA_Frame_Thickness	0.0100
NLA_Aux_Level01_Height	3.0000	
NLA_Aux_Level02_Height	6.0000	
NLA_Aux_Level03_Height	9.0000	
NLA_Total_Height	14.0000	
NLA_Travel_Height	9.0000	

- 1 - Open the showcase
- 2 - Select the type of lift you need and copy it into your file
- 3 - Place the family in the proper place. The family must be placed on the lowest level the lift will assist
- 4 - It will be helpful to have a section cutting the lift in order to fill the information in the Type Properties
- 5 - According to the dimensions in your section fill these parameters
- 6 - Request your Project Manager the info to fill these parameters

7 - In detail design it might be needed to extract the BR's schedule, in that case, these parameters have to be filled

Data

NLA_Code	EVoc
NLA_Block	xx
NLA_Our	public
NLA_Load	600kg
NLA_Capacity	10
NLA_NumberOfLevels	4
NLA_Door_Type	central
NLA_Speed	1.6 m/s
NLA_Observations	
NLA_Rotation	single/double
NLA_Type	
NLA_AssocativeProperties	
NLA_FireRating	
NLA_FireHouse	
NLA_MetalSheetProtection	
NLA_PanicBar	
NLA_Rateman	
NLA_GlassDescription	
NLA_Schedule	
NLA_Comments	
NLA_SupplierModel	

What do these parameters do?

<< Previous OK Cancel Apply

AUTOMATION



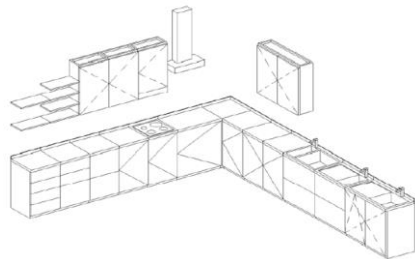
In this showcase there are also several mixes of solutions for wardrobes, but this file is in development. If it is necessary a different solution, it should be requested to the BIM Coordinator of the project that should consult with the BIM Manager.

The purpose of this file is to try to maximize solutions and have a limit number of options in order to standardize the process. The new families must be reviewed and eventually will be included in this showcase.

All these families are parametric, these means all dimensions are editable.

The structure of the final family is according to the diagram on the right.

NOTE: These families are set to not show the door panels in views with detail 'Medium', in order to allow the visualization of the interior.

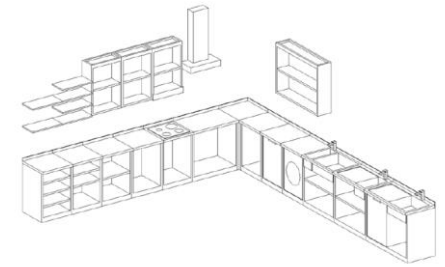
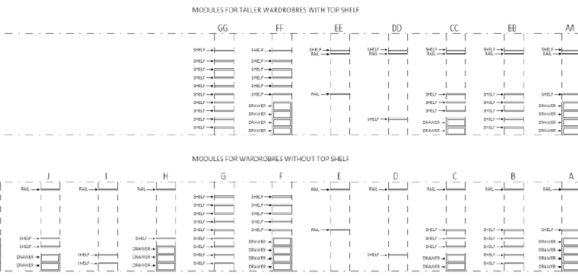
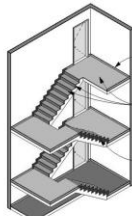
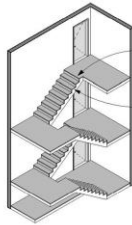


The family you have to import to the project

35.7. Stairs

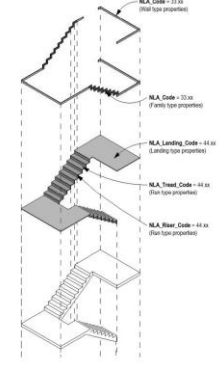
A - Modelling

Parts of the stair



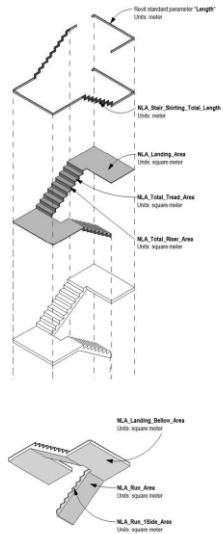
B - Coding

Coding parameters



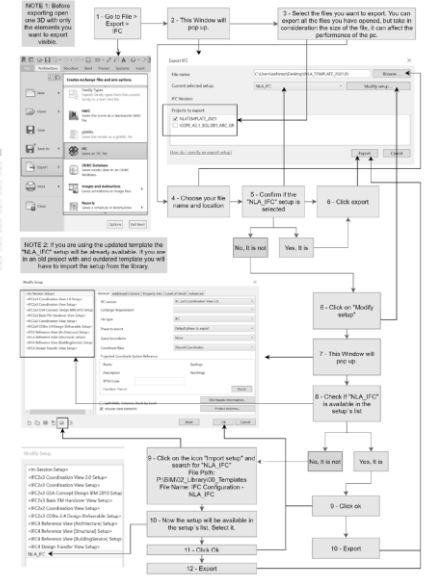
C - Taking quantities

Measurement parameters



Notes

- Elements with different colors represent different modelled details.
- These shared parameters are from NLA's .td file. If the project is based in an old template, the parameters must be imported.
- In order to be the measurement parameters there is a default script to use. Through browser place in a default script to use. Through browser place in a default script to use. Through browser place in a default script to use.



AUTOMATION PROGRAMMING

WHAT YOU NEED TO START
PROGRAMMING?



N L A



AUTOMATION PROGRAMMING

WHAT YOU NEED TO START
PROGRAMMING?

SOFTWARE - FREE



N L A



AUTOMATION PROGRAMMING

WHAT YOU NEED TO START
PROGRAMMING?

SOFTWARE - FREE

PEOPLE - NOT FREE

OPTION 1 → HIRE SOMEONE TO DO IT

OPTION 2 → TRAIN SOMEONE TO DO IT



AUTOMATION PROGRAMMING

WHAT YOU NEED TO START
PROGRAMMING?

SOFTWARE - FREE

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NLA's CASE

BIM MANAGER + IT MANAGER



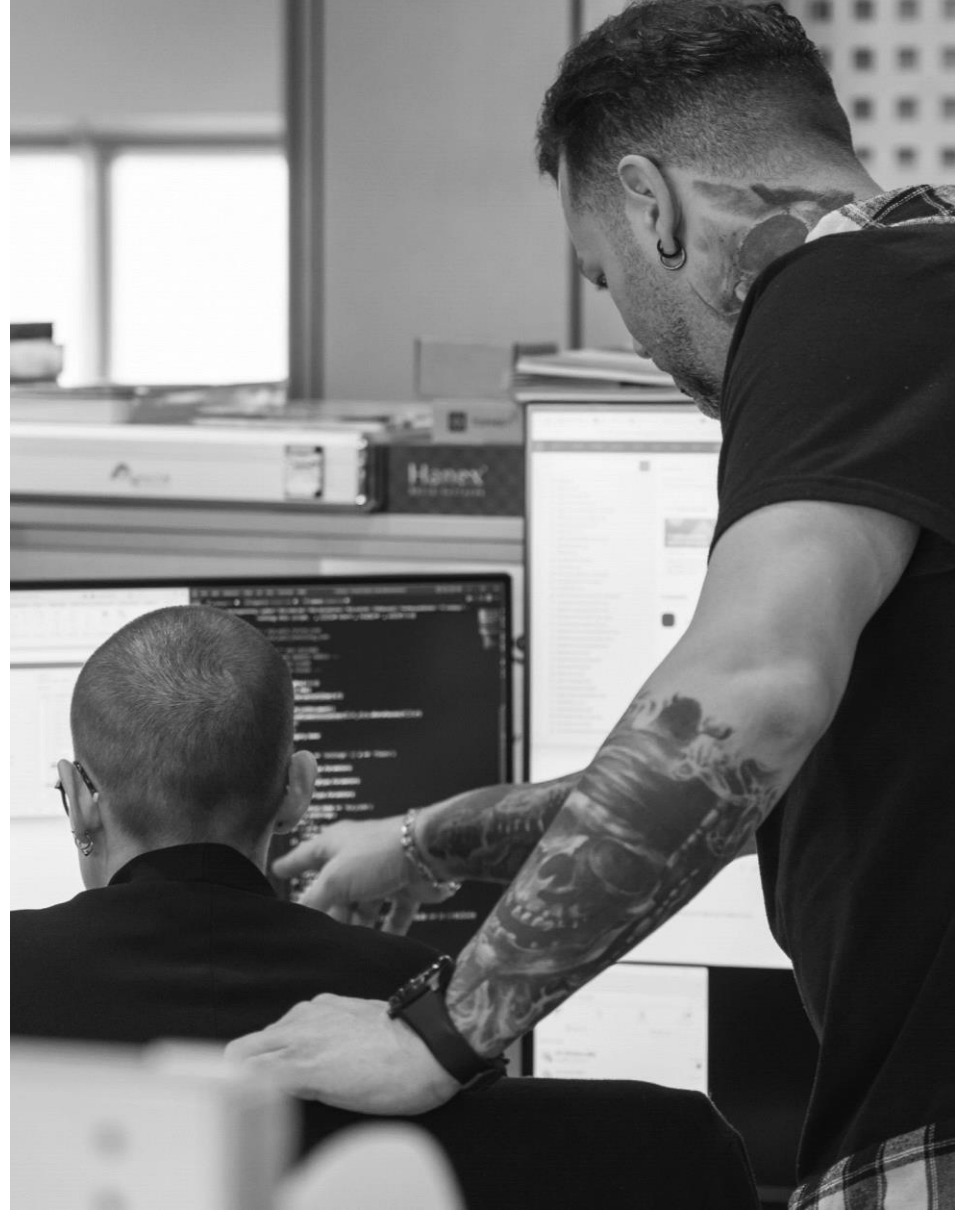
N L A



AUTOMATION
PROGRAMMING
EFFICIENCY
PROFITABILITY



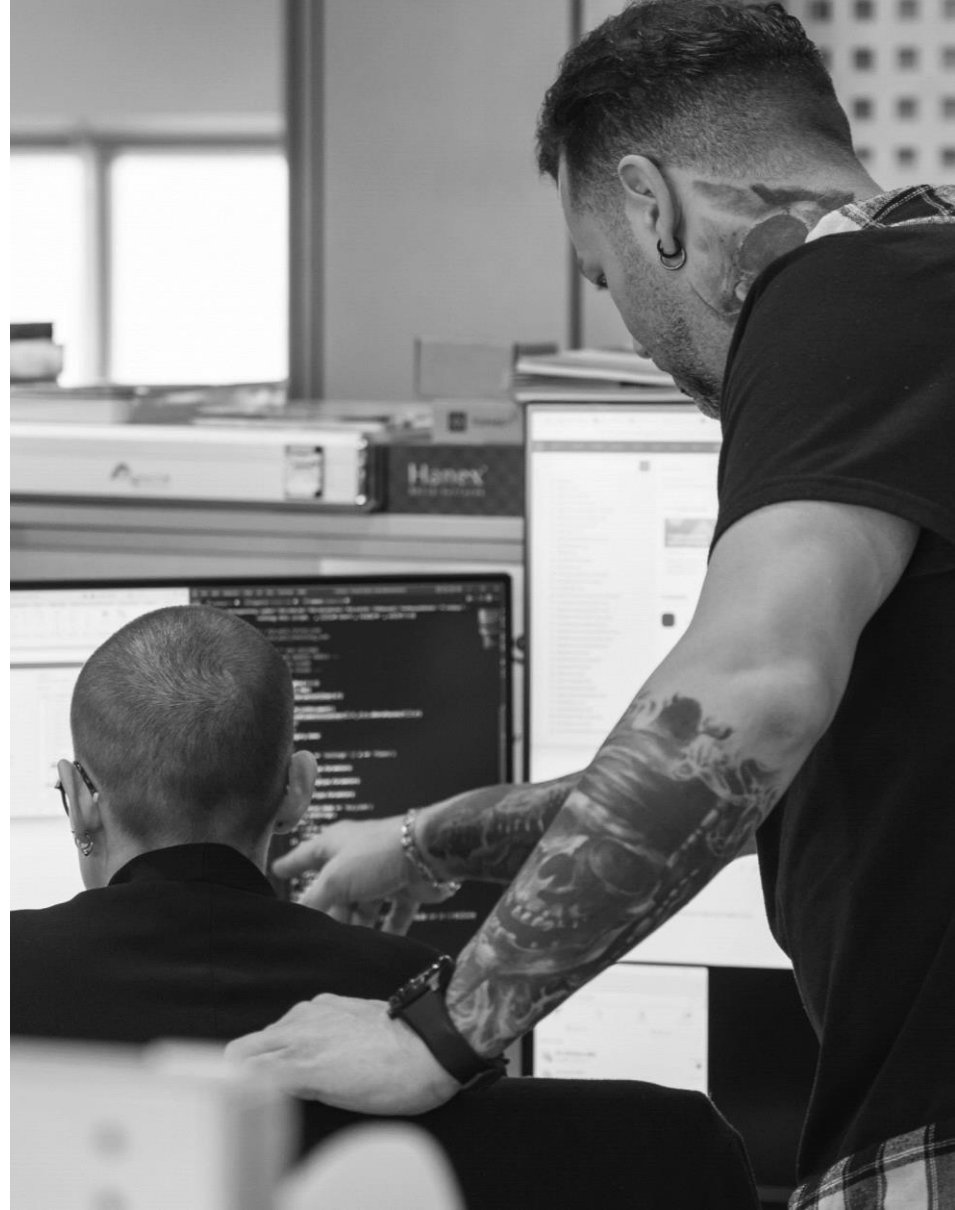
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AUTOMATION
PROGRAMMING
EFFICIENCY
PROFITABILITY

PROCESS

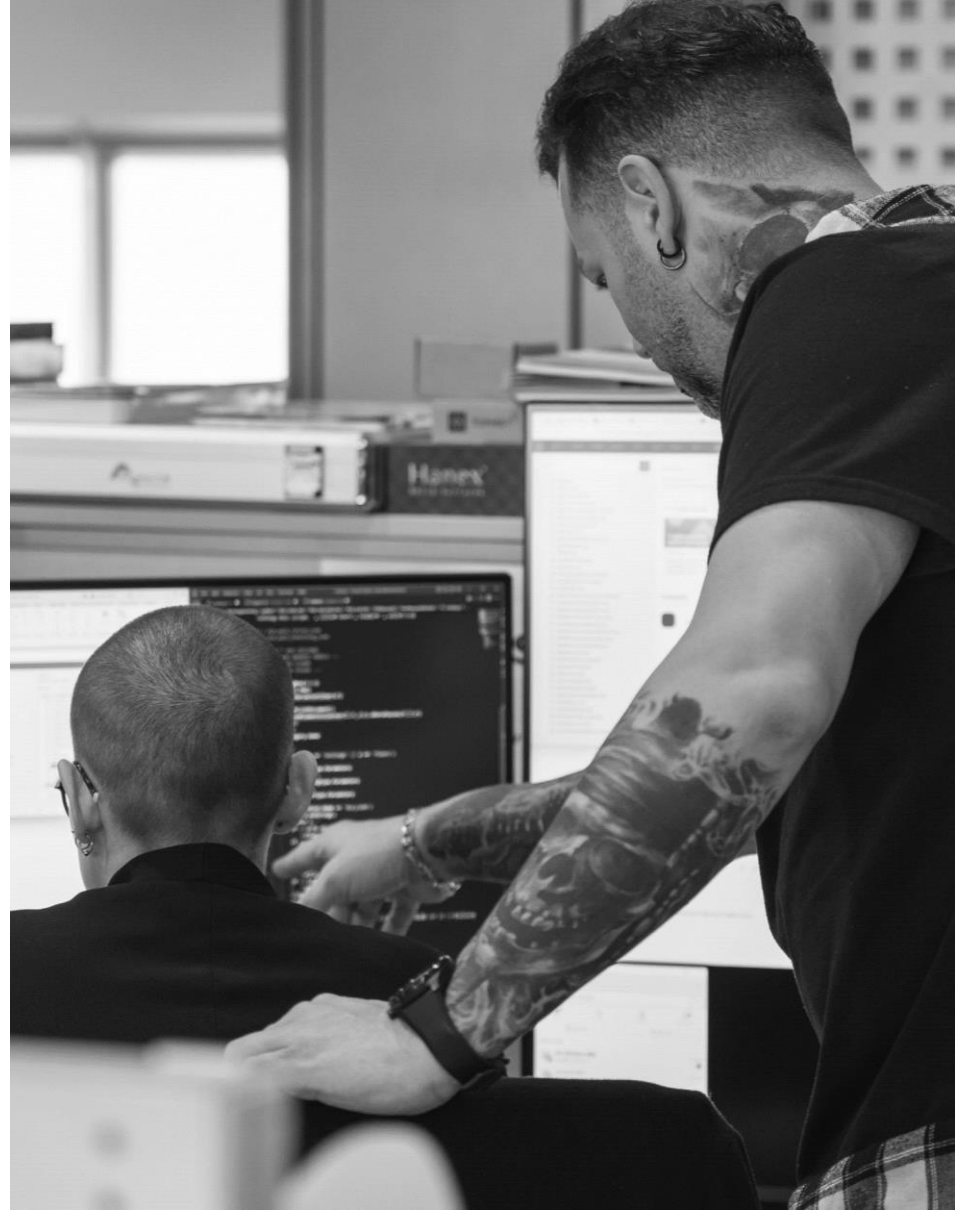
1. Detect your problem
2. Make sure there is no traditional way to solve it
3. Choose the tools you will use
4. Sketch your solution
5. Write the code



AUTOMATION
PROGRAMMING
EFFICIENCY
PROFITABILITY

PROCESS

6. Make a copy of a file project to test on
7. Don't wait for the solution to be perfect to start using it
8. Perfect it and it to the company's automations alongside with auxiliary documentation



TOOLS

LANGUAGES

DYNAMO

PYTHON + PYREVIT

C#

SOFTWARE TO CODE

REVIT API

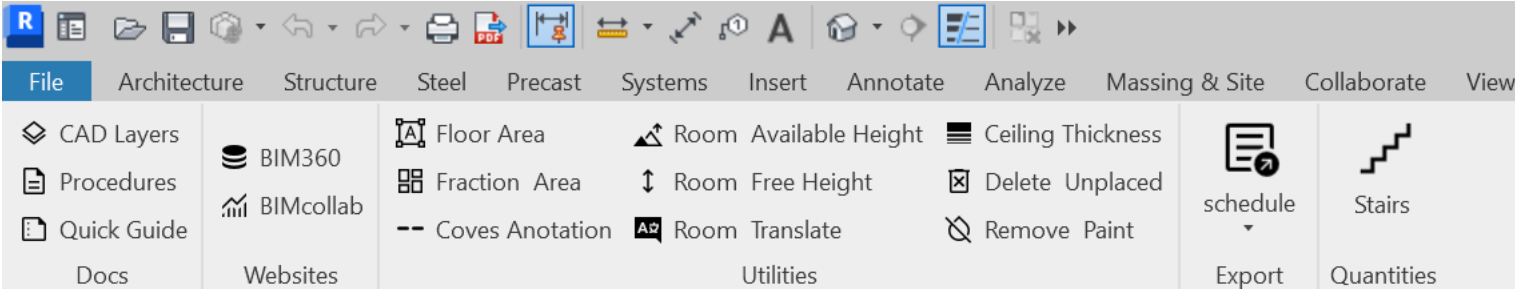
EXAMPLES OF CHALANGES SOLVED

Finishes' Schedule

Stairs' Quantification

Bill Of Quantities

Rooms' Translate



Learn more about
BIM in NLA



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