Implementation of RPA and Python tools in BIM Coordination of Rail Baltica project

Dmitri Garbuzenko

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Speaker



Dmitri Garbuzenko
BIM and AIM Coordinator
RB Rail AS



Agenda

- Introduction of the Project
- BIM review process and automation
- Citizen Developer approach
- Use cases

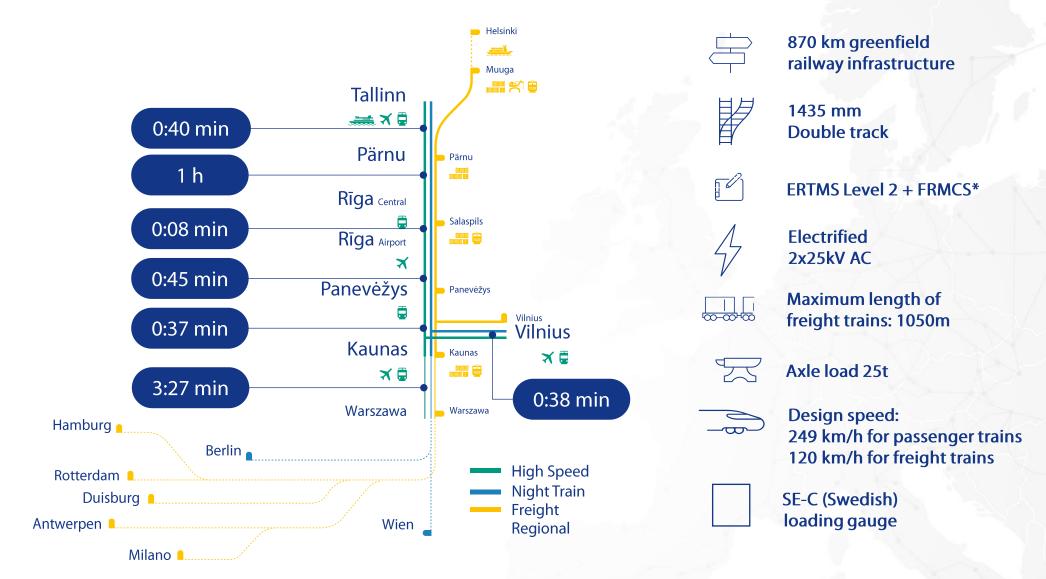
Rail Baltica – part of the North Sea-Baltic core network corridor



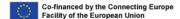




Basis for new economic corridor and military mobility







A truly European project (with 150+ partners)



 More than 150 active contracts with total value above 900 MEUR. Over 50 international partnerships - European industry strongly represented













Rail Baltica – Entering Construction Phase





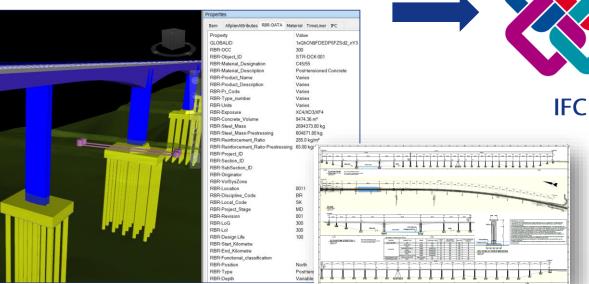




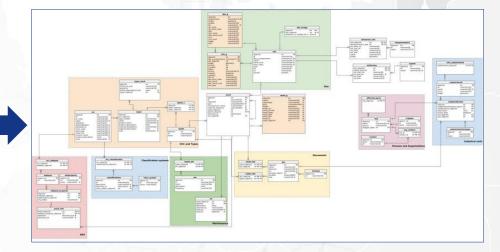
Native BIM model with attribute data -> IFC -> Asset Register

BIM attributes



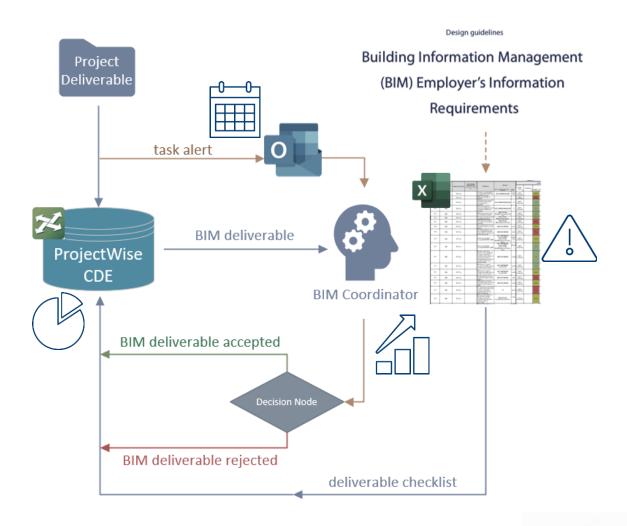


Asset Register database





BIM Review process and spots for automation





Can we get clear picture on upcoming and pending BIM tasks (all PW projects together)?



Can we get BIM team work performance analytics?

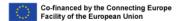


Can we use BIM data to answer Checklist questions?



Can we get BIM issues analytics based on Checklist statuses?





Citizen Developer Approach



A citizen developer is an employee who creates application capabilities for consumption by themselves or others, using tools that are not actively forbidden by IT or business units. A citizen developer is a persona, not a title or targeted role.

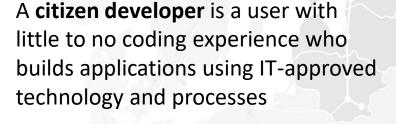
Gartner





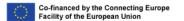
























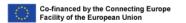


























```
QEXvsDD.ipynb
 + % □ □ ▶ ■ C → Code ∨ ○ O git □ #
  [1]: import pandas as pd_
       import os
       dDrop_excel = 'dd.xlsx'
       all_qex_xls = []
       path = os.getcwd()
       files = os.listdir(path)
       for i in files:
           if i.startswith("qex"):
              all qex xls.append(i)
       print(all qex xls)
       dfs = []
       for file in all gex xls:
           dfs.append(pd.read_excel(file))_
       merged_qexs = pd.concat(dfs)
       header_qex = merged_qexs.iloc[11]___
       qex_df1 = pd.DataFrame(merged_qexs.values[1:],columns=header_qex)
       qex_cleaned = qex_df1[["Object ID","Qty","Unit","YolSysZone"]]
       qex_cleaned.rename(columns={'Object ID':'RBR-Object_ID'},inplace=True)
       qex_cleaned.rename(columns={'VolSysZone':'RBR-Vol_sys_zone'},inplace=True)
       qex = qex_cleaned.fillna(0)
       qex.drop(qex.loc[qex["RBR-Object_ID"]==0].index, inplace=True)
       qex.drop(qex.loc[qex["Qty"]==0].index, inplace=True)
       qex.to_excel("takealook.xlsx")
```







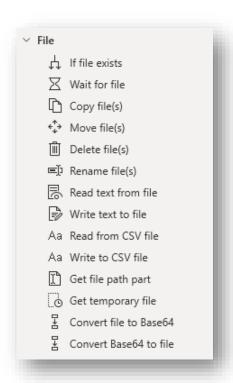


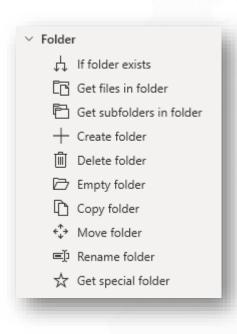


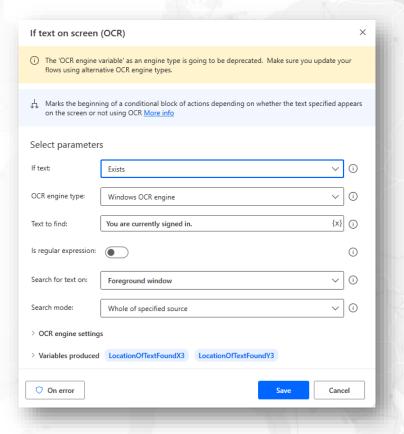




Power BI Desktop











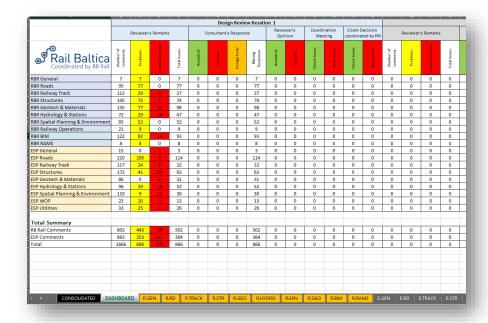




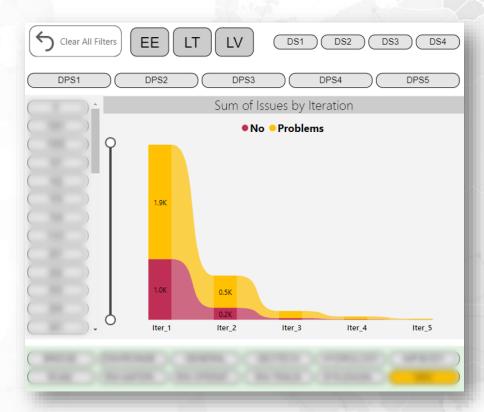


















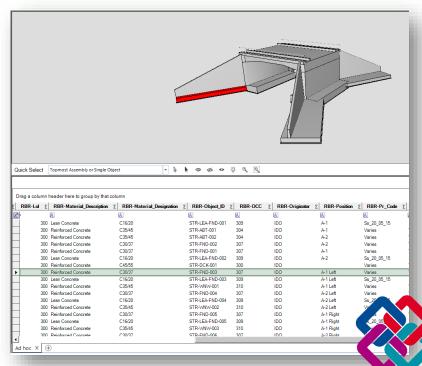


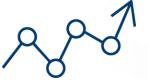






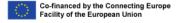
Power BI Desktop





RBR-Project_ID	RBR-Section_ID	RBR-SubSection_ID	RBR-Originator	RBR-Discipline Code
Text	Text	Text	Text	Text
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
RBDTD-EE	DS1	DPS4	IDO	GEO
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RBDTD-EE	DS1	DPS4	IDO	GEO
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RBDTD-EE	DS1	DPS4	IDO	GEO





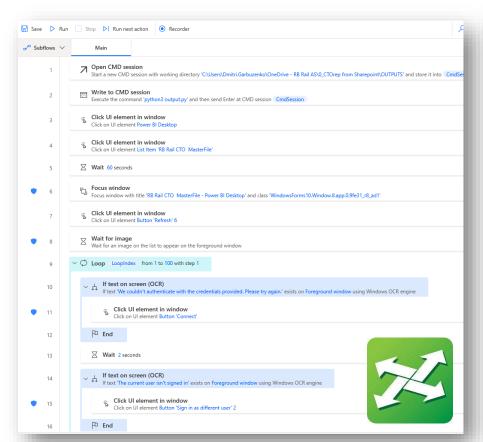
Use Case: BIM Team task management

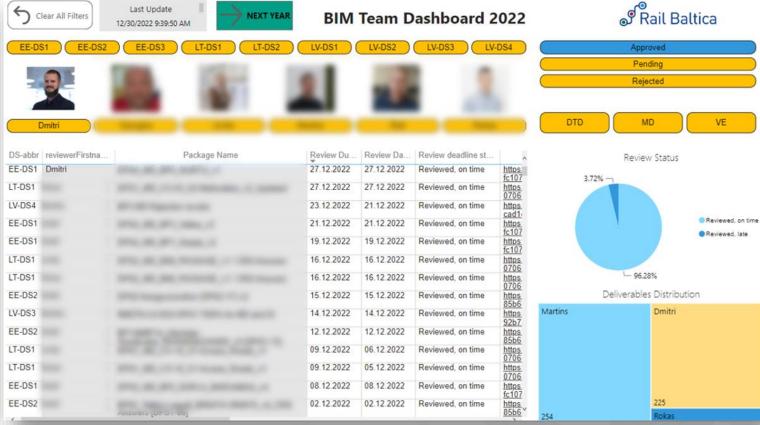


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Can we get BIM team work performance analytics?



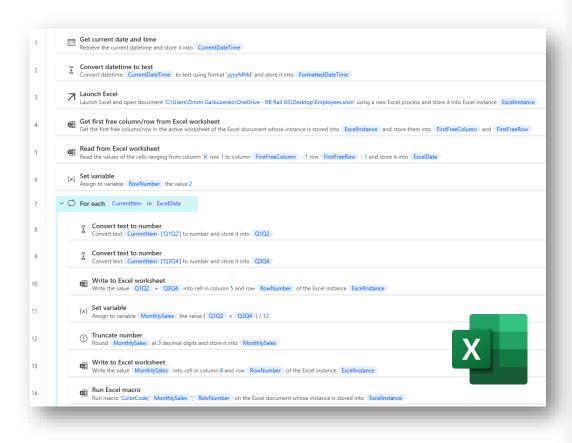


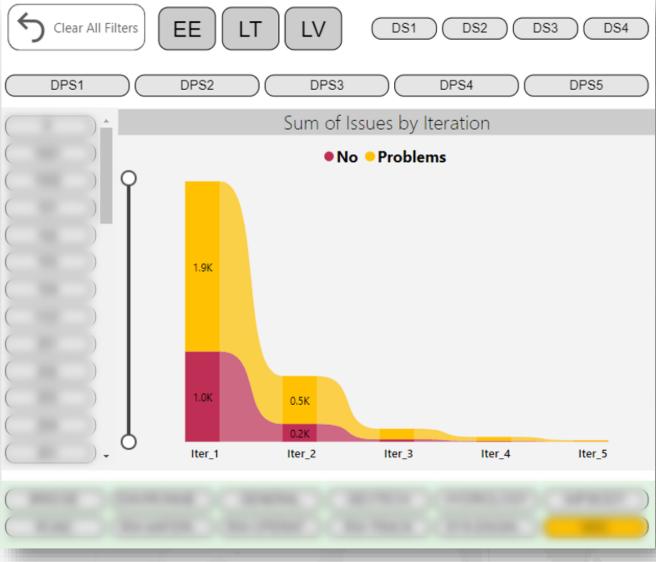


Use Case: Checklist data analytics

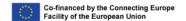


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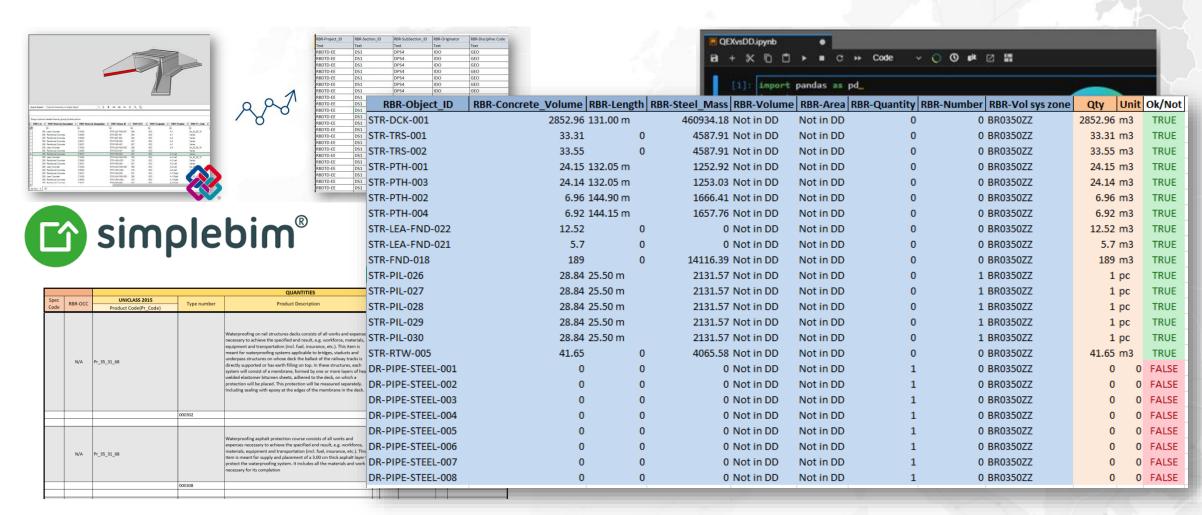






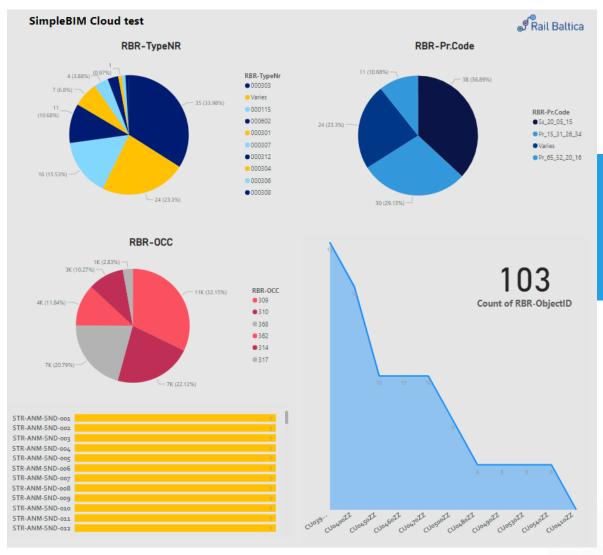


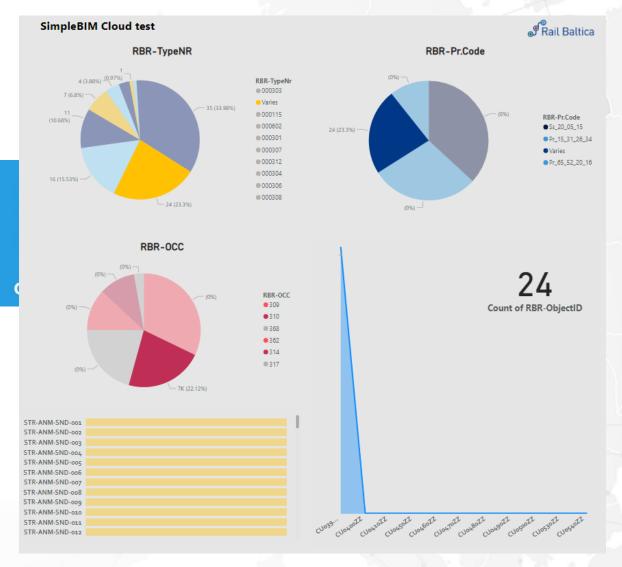
Use Case: QEX and IFC data comparison





On-going Projects: SimpleBIM Cloud









Automation possibilities



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BIM and AIM Coordinator at RB Rail AS | Rail Baltica

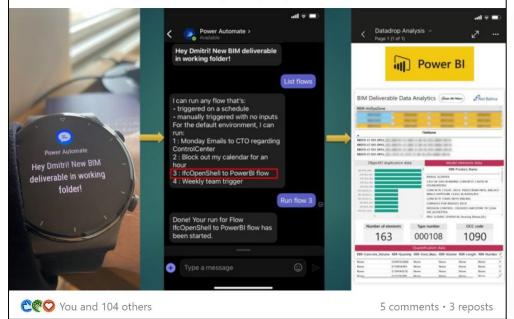


What if you could analyze your BIM deliverables without even opening your laptop? With Power Automate, Teams, Python (ifcOpenShell + Pandas), and PowerBI, you can create a rapid flow to see BIM data and assess model quality—all from your PHONE.



With just a few taps, you'll gain valuable insights that can help you make better, actually data-driven decisions and optimize your workflows before you go to good-old "model rotation".

#bim #python #pandas #data #buildinginformationmodeling #powerautomate #micorsoft #datanalytics #dataanalysis #rpa #powerbi









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BIM and AIM Coordinator at RB Rail AS | Rail Baltica

3d • **G**

Thanks to chatGPT we can now make things that were too hard for BIM coordinators with no previous programming experience. I was struggling with IfcOpenShell more than a year to get IFC data to Pandas Dataframe.

But now, after 30-40 prompts in chatGPT - problem solved. Skript ready without any procurement of any new software(!)

By dragging to PowerBI all needed sources: IFC data (Dataframe to csv) and all other EIR specified tables (OCC codes table, PrCode table, PayItem tables,

QEXvsModelData table, etc) and creating connections between them - any BIM coordinator can get much better understanding what is hidden under geometry and finally focus on that "I" letter in BIM. Finally

#bim #powerbi #data #pandas #chatgpt #bimcoordination

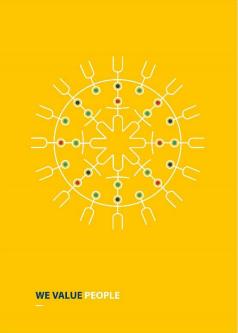


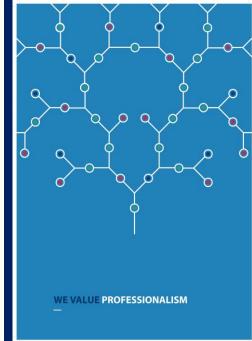


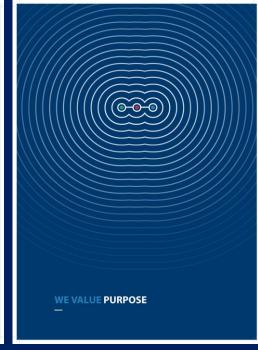
connected Europe

OUR MISSION

We are delivering a seamless mobility for people, goods and services to accelerate social and economic development in the Baltics and beyond







Thank you!