BIMy Project:
D5.2 Demonstrations Available Online

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Version history

Version	Date	Author	Change
0.01	2019-03-22	AKA	Introduction and scope
0.02	2020-01-28	SGO	Add reference to business models in D4.2
0.03	2020-02-28	SGO, OG, TGO	Belgian demos first inputs
1.0	2020-06-01	AKA	First main draft
2.0	2020-06-20	AKA	Finalised

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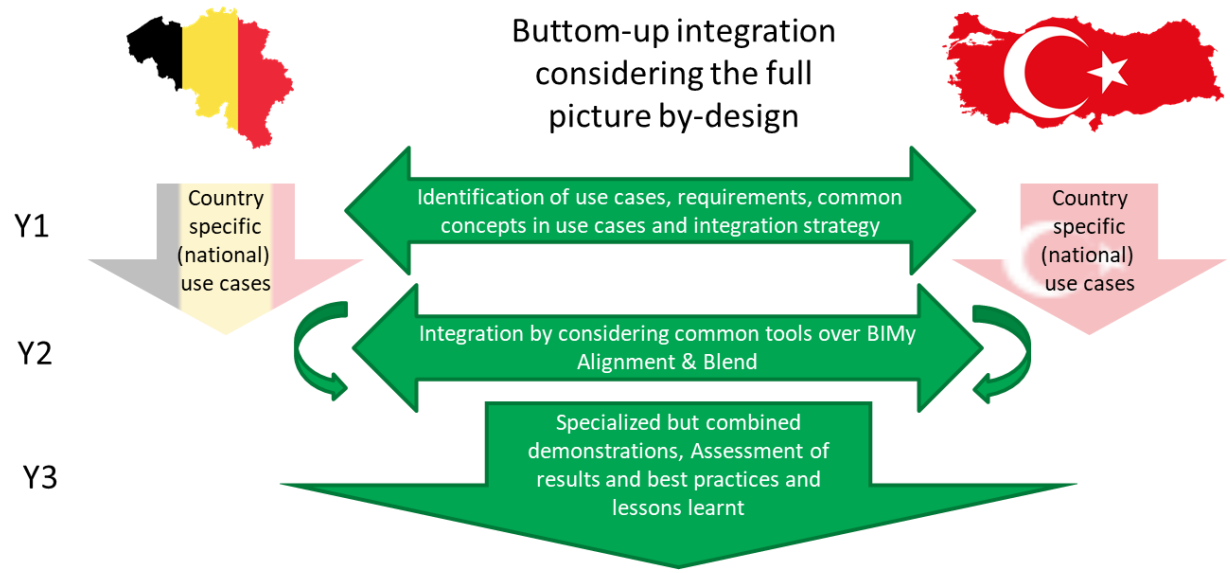
1. Rationale and Motivation behind the Demonstrations

1.1. Introduction

This deliverable aims to give a short summary of the tools, services or any software that are being prepared to be demonstrated in various platforms. The demonstrations have been planned in a bottom-up integration strategy. As depicted in the following figure, in the first year of the project country-specific use cases and related standalone demonstrations were planned. D5.1 gives an overview of the presented standalone tools. These tools are the first results of re-elicitation of the available capacity in the consortium and the reflection of possible re-usable technologies or first developments.

The second year considers an integration over the BIMy platform. Here, the presentable tools and demonstrations are expected to be integrated up to some extent. The third year will finally present the combined demonstration and assessment of results, best practices and lessons learnt.



This deliverable will give an inventory of

- the demonstrations presented online,
- the outcomes of the workshops where project outputs are presented,
- the reflections of public events (exhibitions, conferences, fairs, etc.),

in a nutshell.

1.2. BIMy Rationale and Motivation - Revisited

The BIMy project aims at providing an open collaborative platform for sharing, storing and filtering Building Information Models among different BIM owners/users and integrating and visualizing them in their built and natural environment. BIMy can be seen as an open and generic intermediary that enables interactions between existing and new applications through a unique standardized open API platform. Such a platform

will provide a secure collaborative working environment where different stakeholders can benefit and/or utilize BIM models not only at a single building level but also at larger levels that can be scaled up to wider-area smart city applications.

BIMy will overcome the limitations of current BIM exchange platforms, providing the following features: BIM with scale and time (supporting different levels of details and different stages of the building lifecycle), BIM/GIS semantic and dynamic integration (integrating BIM in their built and natural environment), BIM filtering (providing relevant information according to stakeholders and applications), cooperation (supporting stakeholder interactions), simulation and 3D visualization (mixed and augmented reality through different devices). BIMy is bringing into the consortium all the actors necessary to the successful completion of the platform. There are large companies that can provide a Cloud infrastructure for hosting the BIMy platform and contribute with bigger resources when needed. The smaller companies offer more focused know-how to specified tasks as collaboration or BIM sharing and visualization. The research partners will support companies with more complicated problems such as creating simple API and modeling and integrating BIM and GIS at different scales and times. BIM owners/users have an important role in the definition of the requirements, modelling, in offering their expertise for different applications and business models as well as the evaluation of demonstrators. The demonstrators in both countries improve the chances to make BIMy more replicable to new countries and environments. This enhances remarkably the market potential of BIMy.

1.3. Business models

In deliverable 'D4.2 v1 Report for business and exploitation models' (BIMy consortium, 2020, p. 2) we have analysed in detail several business models for the BIMy platform, such as:

- **Online tendering: BIM4Facility Management;**
- **BIM/GIS data broker: integrate urban context information into BIM models**;
- **BIM/GIS data broker: BIM4Insurance data extractor**;
- **BIM/GIS data broker**: **BIM4utility data extractor.**

The business models have been analysed on the basis of literature review and validated via interviews and surveys with key stakeholders. In this deliverable, we summarize the demonstrations that we have made available online. These demonstrations intend to further check the validity of the business models

2. Demonstrations & Trials

Aligned with the use cases eleven online demonstrations, trials or exhibitions have been developed aiming to present a baseline for further extensions to a wider community. This section gives an overview of these demonstrators all of which have been planned and demonstrated mainly during the first (year) and second (year) iteration of the project.

2.1. Summary of the Demonstrators/tools/applications

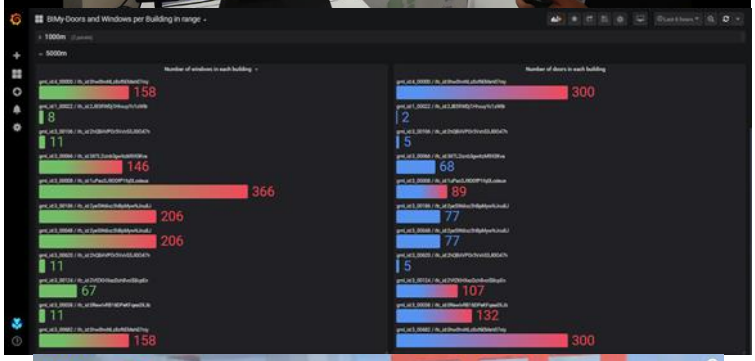
Summary of the demonstrators and related use cases are given in Table 1.

Table 1. Summary of the Demonstrators

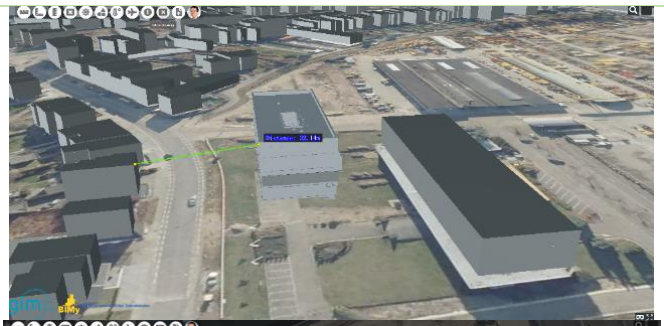
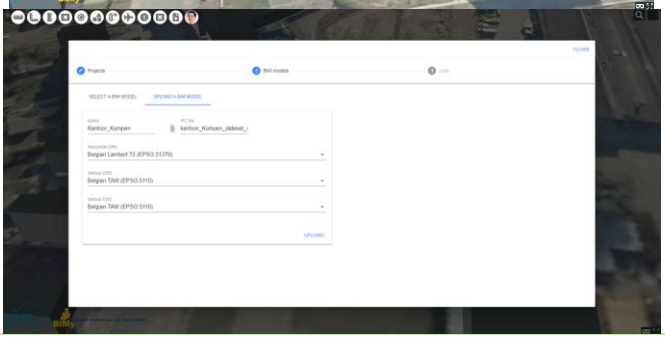
Type	UCS ID(s)	Demonstration	Lead	Team
Demo	10, 11	Demo 0. SCEWC 2019 demo https://youtu.be/ezLQqI0orkU	Erarge	Netas
Demo	ALL	Demo 1. BIMy Web Viewer integrated with BIMy API	GIM	Indirect contributions w.r.t. BIMy platform developments
Demo	7	Demo 2. Digital building permit on-site inspection set-up and execution https://youtu.be/7xbCRpocRz4	LetsBuild	Indirect contributions w.r.t. BIMy platform developments
Demo	7	Demo 3. BCF API for interoperability between BIMy and other BIM platforms (Technical) https://youtu.be/d5GZSEgqwZA	LetsBuild	Indirect contributions w.r.t. BIMy platform developments
Demo	10, 11, 14	Demo 4. VR Disaster Training Simulator https://youtu.be/s2QYlRiNrZc	Erarge	Assar
Demo	7	Demo 5. Revit model checker https://youtu.be/oyRAsok7SIQ https://youtu.be/4bzk7oLsss8	Geo-IT	Indirect contributions w.r.t. BIMy platform developments
Demo	11	Demo 6. BIM-based minimal daylight criterion & acoustic insulation checks	BBRI	Indirect contributions w.r.t. BIMy platform developments
Vision	2	Demo 7. Long term vision – circular economy (concept)	Willemen	Aproplan, Assar, BBRI, CIRB, Geo-IT, Willemen
Demo + Vision	7	Demo 8. Digital building permit app	Sirris	Aproplan, Assar, BBRI, CIRB, Geo-IT, GIM, Willemen
Vision	8	Demo 9. Facilitate integration of urban context into BIM for architectural design	Assar	Willemen
Demo	ALL	Demo 10. Security demo https://youtu.be/kF4AEfqVLhE	Erarge	Netas

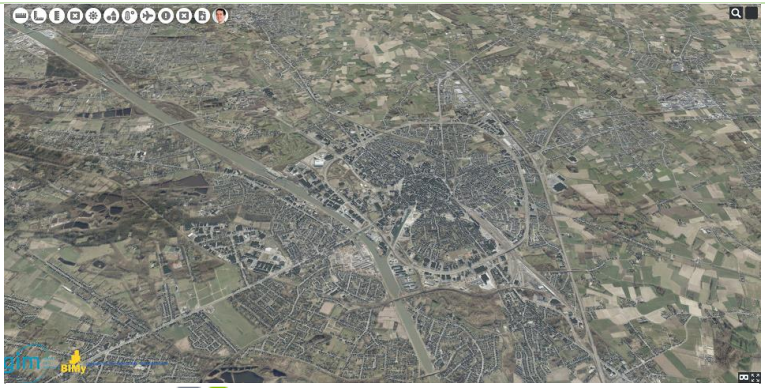
2.2. Demonstration (Demo-0) / BIMy in Smart City Expo World Congress (SCEWC) 2019, Barcelona

Name of the tool/Application/ similar	**BIMy in Smart City Expo World Congress (SCEWC) 2019, Barcelona**
Link	https://youtu.be/ezLQqI0orkU 
Partners Contributing	*ERARGE, NETAS*
Responsible researcher(s) for technical discussions	*Alper KANAK* Ph.D., ERARGE, alper.kanak@erarge.com.tr *Osman Kumaş, NETAŞ,* okumas@netas.com.tr *Nagehan Çakır, NETAŞ,* nagehanc@netas.com.tr
Description	*This video presents the first-year achievements of BIMy, a EUREKA ITEA3 project with Project Nr. 16026. BIMy aims to integrate BIM and GIS models at semantic level and provides a cloud-based platform to utilise the well-known IFC and CityGML ontologies for smarter cities. This video presents an actual use of the integrated BIM-GIS framework and its use as a baseline for a VR-enabled simulation and training application. The VR application aims to increase the awareness of public tin case of a disaster (earthquake or fire) occurs, help them to learn what to do or not to do during catastrophes, and prepare them to reach to the relief and assistance services in a city.*
Target Audience	*Expo participants including smart city experts, city authorities, first responder and relief organisation representatives, ICT experts, social innovators, investors, entrepreneurs, regular citizens or other potential contributors*
Dissemination status	***Public demonstration***
Statistics	*More than 500 participants were informed about BIMy in SCEWC'19. About 50 subjects tried the VR experience.*
Opinions & Feedback	*Nearly all visitors mentioned that they enjoyed the VR experience and shared their positive opinions about the BIMy idea. Although the demonstrated BIM cloud platform and the VR experience was reflecting the first steps, the visitors showed great interest. The idea of using BIM and GIS for critical infrastructure and surroundings protection, training of first responders, public awareness*

	boosting by AR and VR, use of BIM in circular economy at urban transformation scale and the automation of building permit processes had been appreciated. *Some visitors also mentioned that if IoT and heterogeneous data processing and big data analytics improved the solution, BIMy could have a pioneering role in BIM-enabled smart city services. More effective transformation of old data formats (e.g. CAD) to BIM and standardisation of multilateral transformation of building and geophysical data formats was mentioned as the high potential extensions of BIMy in the smart city market.*
Snapshots, Photos and Figures	    

2.3. Demonstration (Demo1) / BIMy Web Viewer integrated with BIMy API

Name of the tool/Application/ similar	**BIMy Web Viewer integrated with BIMy API**
Link	*To be demonstrated in Y2 review*
Partners Contributing	*GIM*
Responsible researcher(s) for technical discussions	*Stijn Goedertier*, GIM, stijn.goedertier@gim.be
Description	*Demonstrates connectivity with many other building blocks in the BIMy Platform.* ▪ *User stories:* ▪ *BIM data and GIS data according to BIMy Data Model: IFC, cadastral parcel, elevation model, ortho, building* ▪ *Authenticate using OAuth2* ▪ *Measure height, distance, surface* ▪ *Upload georeferenced BIM Model via BIMy API* ▪ *Create BCF topics*
Target Audience	*Use case: Digital Building Permit – Integrate BIM in urban context*
Dissemination status	*Consortium only* *Public trial or demonstration*
Statistics	*N/A*
Opinions & Feedback	*N/A*
Snapshots, Photos and Figures	 



BIMy Platform API

This document describes how an application can use the API of the BIMy Platform.
The BIMy API uses the OAuth2 authorization code flow to authenticate. Because all consortium members already have a Gitlab account, it was decided that users of the API can authenticate on Gitlab.com. In the future, other OAuth2 authentication providers could be added.
To create an authenticated session, you first need to request an authorization code on `oauth2/gitlab/authorize` endpoint.
With the authorization code, an access token can be requested on the `oauth2/gitlab/token` endpoint. See the documentation on the Gitlab OAuth2 Authorization code flow for further documentation on the request parameters to use.

Terms of service
Contact the developer
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Web page of the BIMy project

Servers

Authorize

project Operations on project objects.

POST	/project	Add a new project to the BIMy platform
GET	/project/find	Finds projects a user has access to
GET	/project/{projectId}	Get project by ID
PUT	/project/{projectId}	Updates a project
DELETE	/project/{projectId}	Delete a project

model Operations on model objects.

POST	/project/{projectId}/model	Upload (check-in) a BIM model for a project
GET	/model/find	Finds all models the user has access to. Returns the model metadata, not the actual IFC.
POST	/model/query	Query all models the user has access to. Returns a subset of the models' content. The results returned in the same format as the original models.
GET	/project/{projectId}/model/{modelId}/{versionId}	Get the metadata of a model by ID.
PUT	/project/{projectId}/model/{modelId}/{versionId}	Update a BIM model for a project
DELETE	/project/{projectId}/model/{modelId}/{versionId}	Delete model by ID
POST	/project/{projectId}/model/{modelId}/{versionId}/query	Query a specific model the user has access to. Returns a subset of the models' content. The results returned in the same format as the original model.

job Operations to start long-running jobs on the BIMy platform.

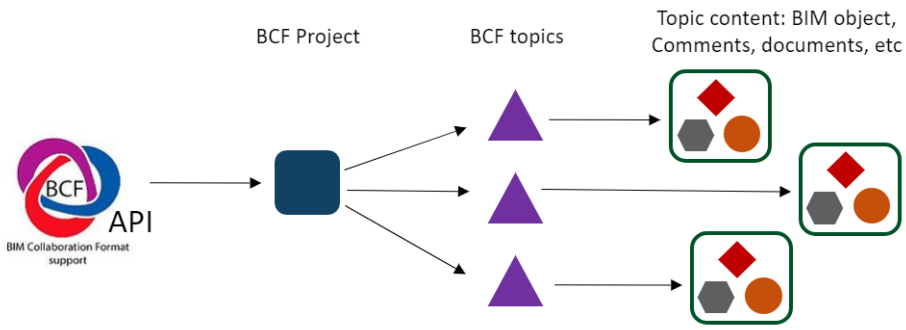
POST	/project/{projectId}/job	Starts job for a project
GET	/project/{projectId}/job/find	Finds jobs a user has access to. Jobs can be running or completed.
GET	/project/{projectId}/job/{jobId}	Get the status and result of a job by its jobID

user Operations on user objects.

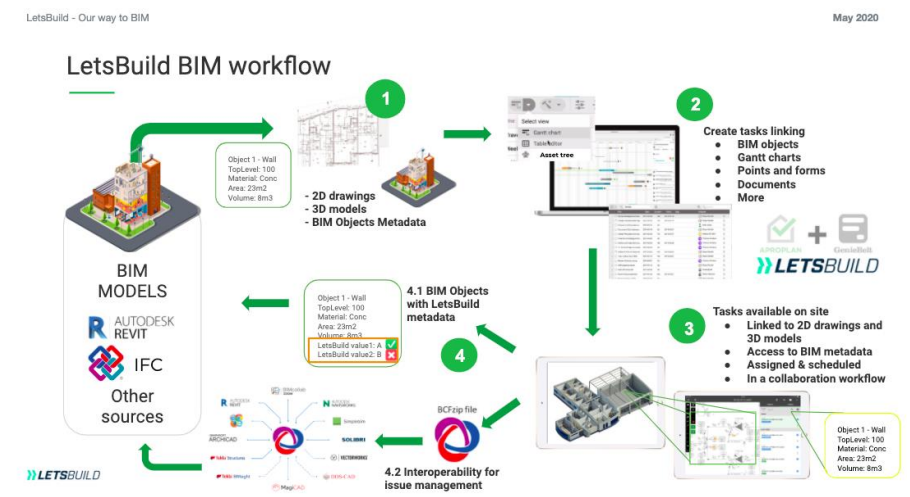
POST	/user/createWithList	Creates list of users with given input array
GET	/user/{username}	Get user by user name
PUT	/user/{username}	Update user
DELETE	/user/{username}	Delete user

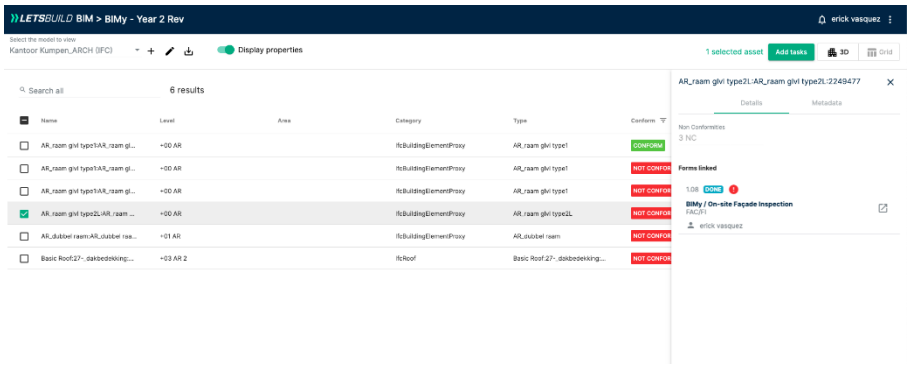
2.4. Demonstrator (Demo 2 & 3) / Digital building permit on-site inspection set-up and execution & BCF API for interoperability between BIMy and other BIM platforms

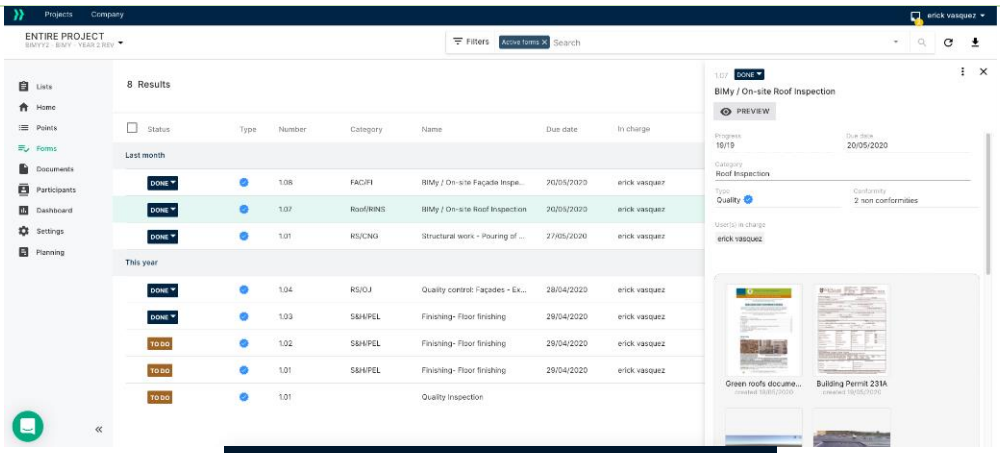
Name of the tool/Application/ similar	**Digital building permit on-site inspection set-up and execution & BCF API for interoperability between BIMy and other BIM platforms**
Link	https://youtu.be/d5GZSEgqwZA https://youtu.be/7xbCRpocRz4 *Content:* 1. *Models management and tasks creation* 2. *Roof inspection set-up* 3. *Façade inspection set-up* 4. *Roof inspection execution* 5. *On-site inspections overview and results on BIM model*
Partners Contributing	*LetsBuild Aproplan*
Responsible researcher(s) for technical discussions	*Olivier Gillin, LetsBuild olivier.gillin@letsbuild.com* *Erick Vasquez, LetsBuild erick.vasquez@letsbuild.com* *Sergio Ristagno, LetsBuild sergio.ristagno@letsbuild.com* *Daniel Pereira, LetsBuild daniel.pereira@letsbuild.com*
Description	*The videos and photos indicated here illustrate the collaboration and interoperability capabilities of the LetsBuild BIM Prototype. LetsBuild BIM Prototype acts as a tool to facilitate on-site utilisation of BIM data, as well as a medium to provide on-site activities updates back to Common Data Environments. In the context of BIMy, LetsBuild is targeting at substracting information of BIM models coming from the BIMy platfrom and connecting on-site inspection data to those.* *Considering that LetsBuild operates as an independent application, it is being developed to operate in an OpenBIM environemnt, currently supporting IFC models and soon supporting BCF issues.* *The prototype is aimed at supporting the digital building permit use case.* • *Create inspections according to digital building permit details coming from the BIMy platform.* • *Provide efficient interfaces for on-site inspections (allow the attachment of annotations, pictures and documents to BIM objects)* • *Send on-site inspection results back to the BIMy platform as BCF topics.*

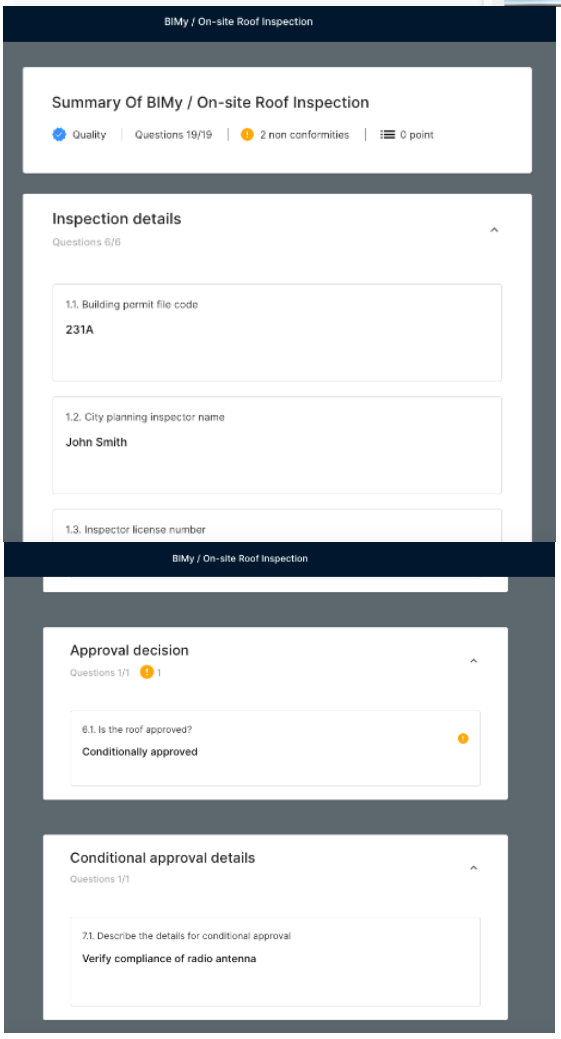
	
Target Audience	*Existing clients and business leads* *BIMy consortium members*
Dissemination status	***Public demonstration***
Statistics	*Number of demonstrations to existing clients and business leads: 25* *Number of users currently enrolled for testing: 13* *Number of requests for testing: 9*
Opinions & Feedback	*Most clients and business leads are interested about the functionalities of the LetsBuild BIM prototype. The prototype facilitates the understanding of the utilisation of BIM models on site for inspections and issues management. In regards to the BIMy project specifically, demonstrations have illustrated the potential for collaboration by using LetsBuild as a complementary platform for on-site activities. The array of features and functionalities already existing in LetsBuild facilitate the implementation of on-site workflows related to the use cases of the BIMy project (Digital building permit, fire inspection, etc). Having an OpenBIM approach has been highlighted as crucial by many users, reason why the existing support for IFC models and the future development of BCF functionalities for issues management in the BIM prototype have been well perceived.* *Nonetheless, clients, business leads and BIMy consortium members have highlighted a few limitations of the BIM prototype: a) The 3D viewer is in early phases of development and needs more robust navigation and features. b) The 3D viewer is only available on the web version. Despite being integrated with the mobile on-site workflows of LetsBuild, users are looking forward to using the 3D model in mobile devices. c) Issues management and inspection workflows are powerful, but users would like to see extended functionalities for other construction processes (Planning, progress reports, quantity surveying, etc).*

Snapshots, Photos and Figures






Projects
Company
erick vasquez
ENTIRE PROJECT
Filters
Active forms
Search
Lists
Home
Points
Forms
Documents
Participants
Dashboard
Settings
Planning
8 Results
Status
Type
Number
Category
Name
Due date
In charge
Last month
This year
BIMy / On-site Roof Inspection
PREVIEW
Roof inspection
Quality
2 non conformities
erick vasquez
Green roofs docume...
Building Permit 231A

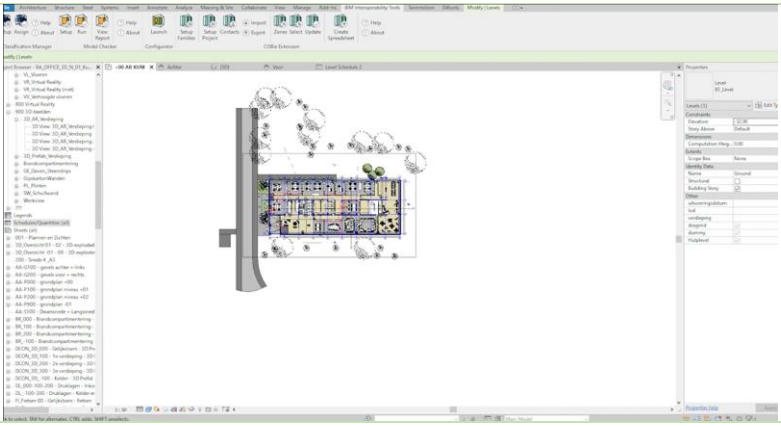

BIMy / On-site Roof Inspection
Summary Of BIMy / On-site Roof Inspection
Quality
Questions 19/19
2 non conformities
0 point
Inspection details
Questions 6/6
1.1. Building permit file code
231A
1.2. City planning inspector name
John Smith
1.3. Inspector license number
BIMy / On-site Roof Inspection
Approval decision
Questions 1/1
6.1. Is the roof approved?
Conditionally approved
Conditional approval details
Questions 1/1
7.1. Describe the details for conditional approval
Verify compliance of radio antenna

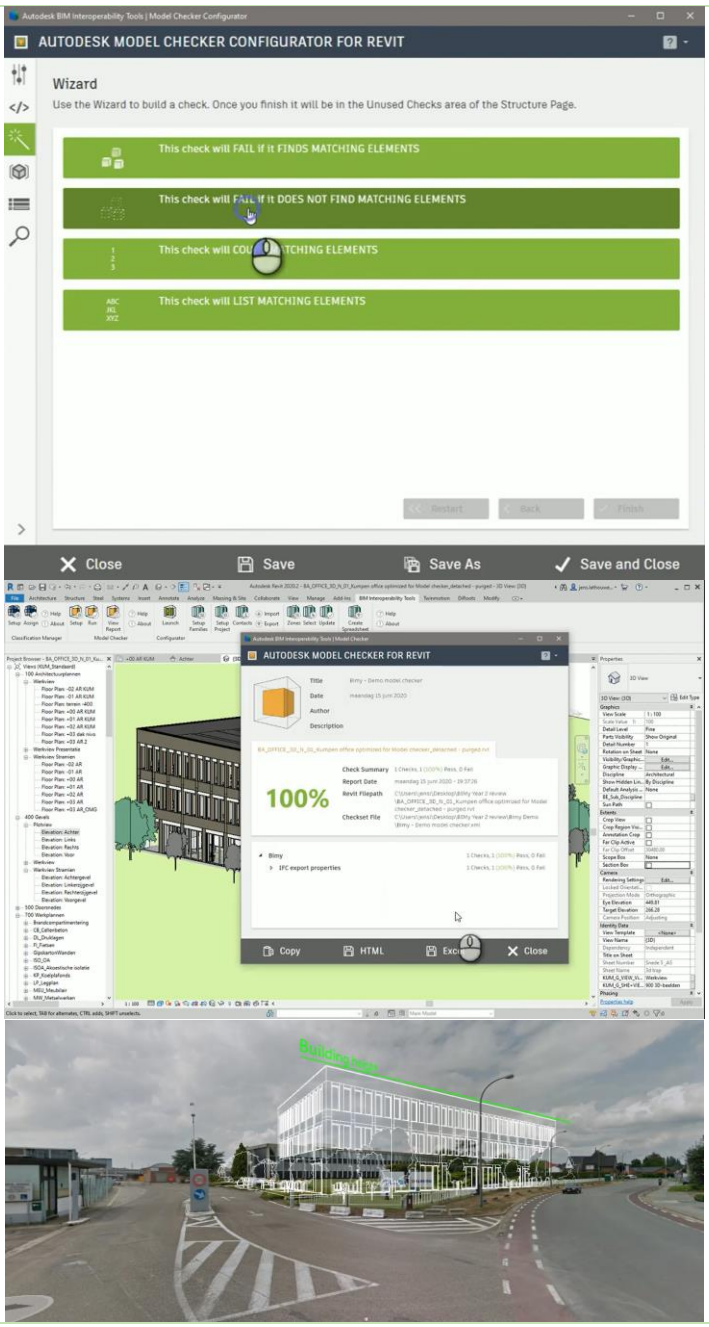
2.5. Demonstrator (Demo 4) / VR Disaster Training Simulator

Name of the tool/Application/ similar	**VR Disaster Training Simulation**
Link	https://youtu.be/s2QYlRiNrZc
Partners Contributing	*ERARGE, ASSAR, NETAŞ*
Responsible researcher(s) for technical discussions	*Alper KANAK* Ph.D., ERARGE, alper.kanak@erarge.com.tr *Ibrahim ARIF,* ERARGE, ibrahim.arif@erarge.com.tr *Thomas GOOSSENS,* ASSAR, tgo@assar.com
Description	*An intermediary demo, as a result of joint study between ERARGE and ASSAR Architects in BIMy.* *The simulation effectively uses the BIMy platform by extracting virtual 3D layers with pre-queries. Semi-automatic content adaptation is applied by following these steps:* • *Information model is retrived by BIMy queries (what to be presented)* • *Models generated in ifc format* • *Ifc formats parsed into .dae format (automatic parser-dockerized).* • *Dae file saved on BIMy simulation folder.* • *Dae file imported to Unity (dockerized)* • *Dae file parsed elements by name and materialized and becomes prefab (automatic alignment and renaming for better organization of BIM & GIS content)* • *Props and Scenarios are created, refined (by development over Unity).*
Target Audience	*Municipalities, city planners, disaster trainees, fire brigade*
Dissemination status	***Public demonstration***
Statistics	*NA*
Opinions & Feedback	*Positive thoughts from consortium partners were shared, whilst additional improvements on the simulation were offered during the development.*
Snapshots, Photos and Figures	

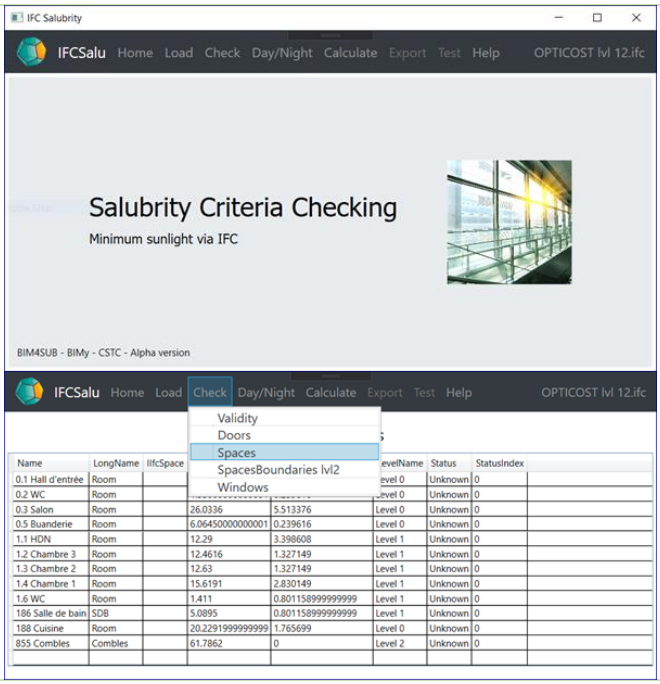

There is fire occured in the building.Plese
stay calm
There is fire occured in the building.

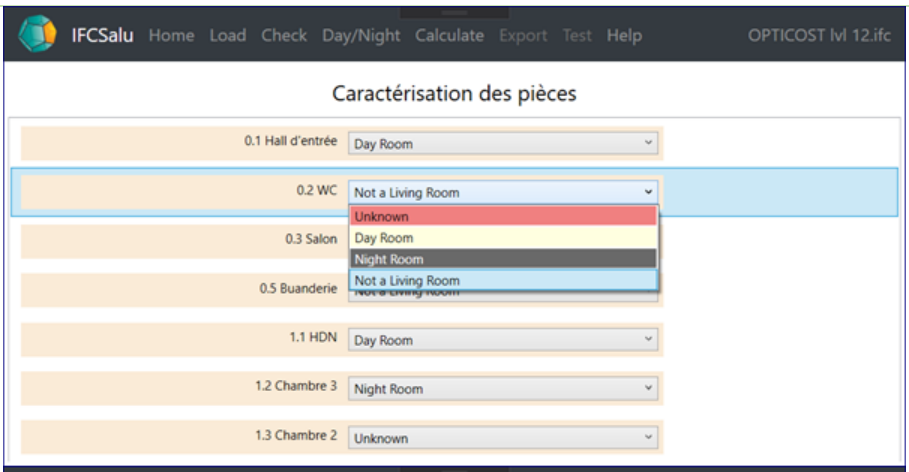
2.6. Demonstrator (Demo 5) / Revit model checker

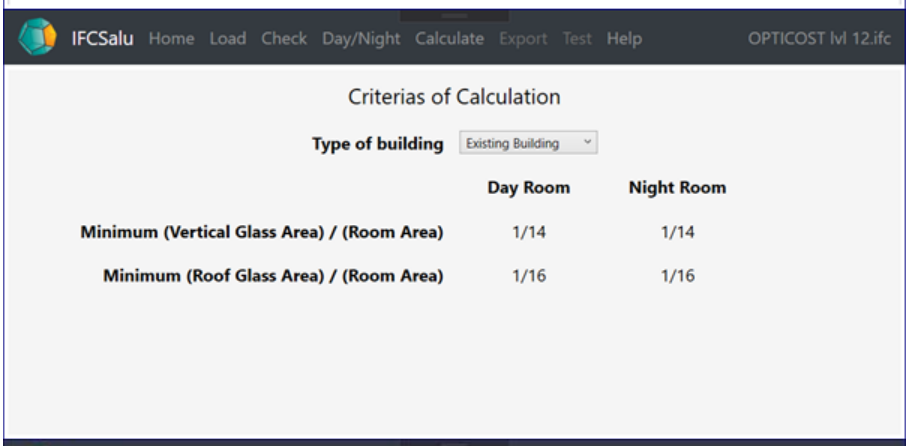
Name of the tool/Application/ similar	**Revit model checker**
Link	https://youtu.be/oyRAsok7SIQ https://youtu.be/4bzk7oLsss8
Partners Contributing	*Geo-IT, BIMy platform contributors*
Responsible researcher(s) for technical discussions	*Jens Lathouwers,* Geo-IT, jens.lathouwers@geoit.be
Description	*In the current situation, there's no widespread standardization, and there's no efficient way to check models on compliance with a bim protocol. From the beneficial aspect, the Revit model checker can be provided, together with a standardization method and modelling guidelines to give either the creator of the model, or the receiving party the possibility to check the compliance between those three documents.*
Target Audience	*Architects, designers*
Dissemination status	***Public demonstration***
Statistics	*NA*
Opinions & Feedback	*The following months the knowledge gained by working on the building permit use-case will be exploited to apply it to create a check-set for the fire regulation use case.* *The exported xml from the check should be exchangeable between the Revit model checker and the Bimy platform to use the same checks on both sides of the regulations.*
Snapshots, Photos and Figures	

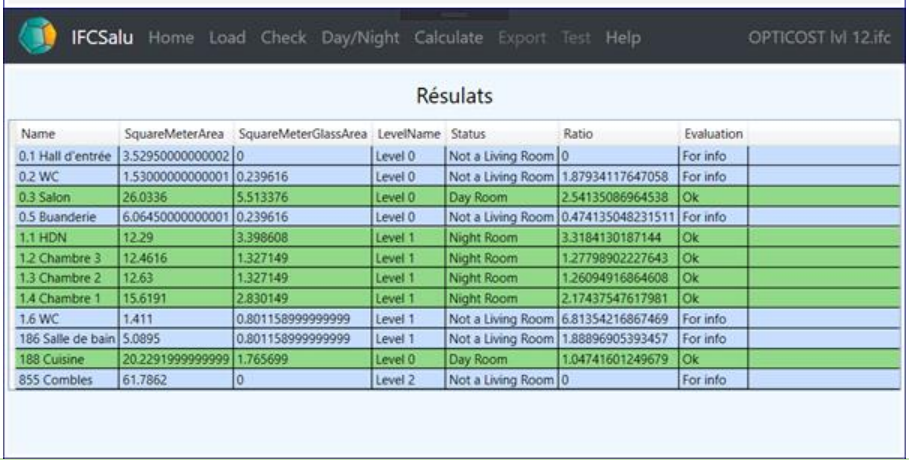

AUTODESK MODEL CHECKER CONFIGURATOR FOR REVIT
Wizard
Use the Wizard to build a check. Once you finish it will be in the Unused Checks area of the Structure Page.
This check will FAIL if it FINDS MATCHING ELEMENTS
This check will LIST MATCHING ELEMENTS
Close
Save
Save As
Save and Close
AUTODESK MODEL CHECKER FOR REVIT
100%
Copy
HTML
Close

2.7. Demonstrator (Demo 6) / BIM-based minimal daylight criterion & acoustic insulation checks

Name of the tool/Application/ similar	**IFC Salubrity Criteria Checking application**
Link	*NA*
Partners Contributing	*BBRI, Sirris*
Responsible researcher(s) for technical discussions	*Robberts François, BBRI, francois.robberts@bbri.be*
Description	The application is based on the Order of the Walloon Government of 30 August 2007. It allows to verify one of the salubrity criteria presented by the document: the criterion of minimum natural lighting. To do this, the program extracts from an IFC file the necessary data available and allows the user to check the conformity of the model with the rules in effect.
Target Audience	Government authorities auditing this criterion, and entities subject to the audit
Dissemination status	***Public demonstration*** *Consortium only*
Statistics	*Not public yet*
Opinions & Feedback	*NA*
Snapshots, Photos and Figures	







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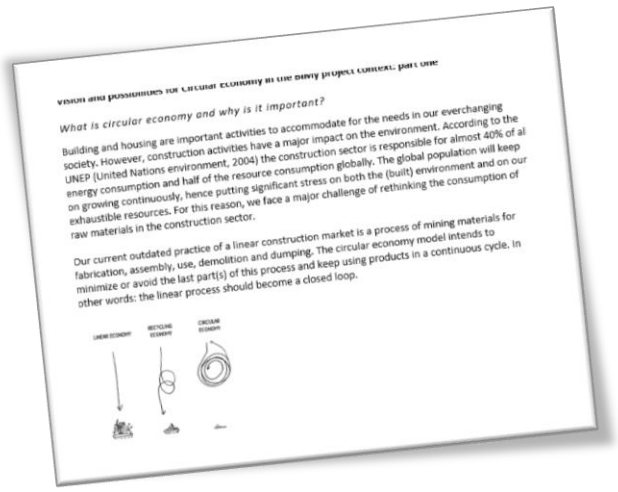
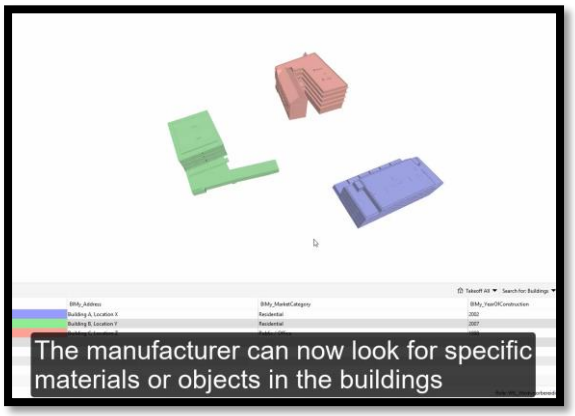
0.2 WC	1.53000000000001	0.239616	Level 0	Not a Living Room	1.87934117647058	For info
0.3 Salon	26.0336	5.513376	Level 0	Day Room	2.54135086964538	Ok
0.5 Buanderie	6.06450000000001	0.239616	Level 0	Not a Living Room	0.474135048231511	For info
1.1 HDN	12.29	3.398608	Level 1	Night Room	3.3184130187144	Ok
1.2 Chambre 3	12.4616	1.327149	Level 1	Night Room	1.27798902227643	Ok
1.3 Chambre 2	12.63	1.327149	Level 1	Night Room	1.26094916864608	Ok
1.4 Chambre 1	15.6191	2.830149	Level 1	Night Room	2.17437547617981	Ok
1.6 WC	1.411	0.801158999999999	Level 1	Not a Living Room	6.81354216867469	For info
186 Salle de bain	5.0895	0.801158999999999	Level 1	Not a Living Room	1.88896905393457	For info
188 Cuisine	20.2291999999999	1.765699	Level 0	Day Room	1.04741601249679	Ok
855 Combles	61.7862	0	Level 2	Not a Living Room	0	For info

2.8. Vision (Vision 7) / Long term vision – circular economy (concept)

Name of the tool/Application/ similar	**Circular Economy: Long term Vision – Online article in two parts**
Link	*Web link to article to be added after publication*
Partners Contributing	*Willemen, Assar, GIM*
Responsible researcher(s) for technical discussions	*Hashmat Wahid, Willemen, Hashmat.wahid@willemen.be* *Dieter Froyen, Willemen, dieter.froyen@willemen.be* *Lise Bibert, Willemen, lise.bibert@willemen.be*
Description	*Article explaining the possibilities for applications regarding Circular Economy in the long term on the BIMy platform and the limitations that prevent current exploitation that need to be overcome.* *Includes a conceptual demo video of a future possible application.*
Target Audience	*Construction companies in the broadest sense of the word* *Manufacturers of construction materials* *Government or consulting bodies imposing BIM or building regulation* *Any other parties that have an interest in Circular Economy*
Motivation	*This article could create spirit with the target audience to contribute to better or more standardised workflows, agreements or requirements.*
Dissemination status	*Public demonstration (not yet published)*
Statistics	*NA*
Opinions & Feedback	*NA*
Snapshots, Photos and Figures	

	 The manufacturer can now look for specific materials or objects in the buildings

2.9. Demonstration and Vision (8) / Digital building permit app

Requesting a building permit can be a tedious administrative task, in which information is often duplicated and later lost. This demonstrator shows how the process could be simplified/streamlined using a digital Building Permit Application supported by the BIMy platform.

The application is developed as a collaboration between all consortium partners. It highlights the different individual contributions, but also demonstrates a complete proof of concept of the BIMy platform. The motivation behind this vision is that the inclusion of BIM (or BIMy) in mandatory public processes such as building permit requests could be a catalyst for widespread adoption.

Name of the tool/Application/ similar	**Building Permit Application (Evacuation in case of a disaster)**
Link	https://drive.google.com/file/d/1l_cXgDNVPjKJXEQa9OcgP0OxFu88Z0yW/view
Partners Contributing	*ASSAR, BBRI, ERARGE, Geo-IT, GIM, Letsbuild, NETAS, Sirris, Willemen*
Responsible researcher(s) for technical discussions	*Olivier Biot, Sirris, olivier.biot@sirris.be* *Stijn Goedertier, GIM, stijn.goedertier@gim.be* *Thomas Goossens, ASSAR, tgo@assar.com* *François Robberts, BBRI, francois.robberts@bbri.be* *Erick Vasquez, Letsbuild, Erick.vasquez@letsbuild.com*
Description	*Requesting a building permit can be a tedious administrative task, in which information is often duplicated and later lost. This demonstrator shows how the process could be simplified/streamlined using a digital Building Permit Application supported by the BIMy platform.* *The application is developed as a collaboration between all consortium partners. It highlights the different individual contributions, but also demonstrates a complete proof of concept of the BIMy platform.*
Target Audience	*Architects, city planners, building owners*
Motivation	*The inclusion of BIM (or BIMy) in mandatory public processes such as building permit requests could be a catalyst for widespread adoption.*
Dissemination status	***Currently: Consortium only*** *Later: public demonstrator*
Statistics	*NA*
Opinions & Feedback	*NA*

Snapshots, Photos and Figures	

2.10. Demonstrator & Vision (Demo 9) / Facilitate integration of urban context into BIM for architectural design

Architects currently use a wide variety of incompatible tools to gather information about new project locations. This essential part of the design process often involves a lot of 'digital labour'. A better integration of GIS and BIM could not only make this process more efficient, but also provide new, easy-to-use tools that support and improve the architect's design process.

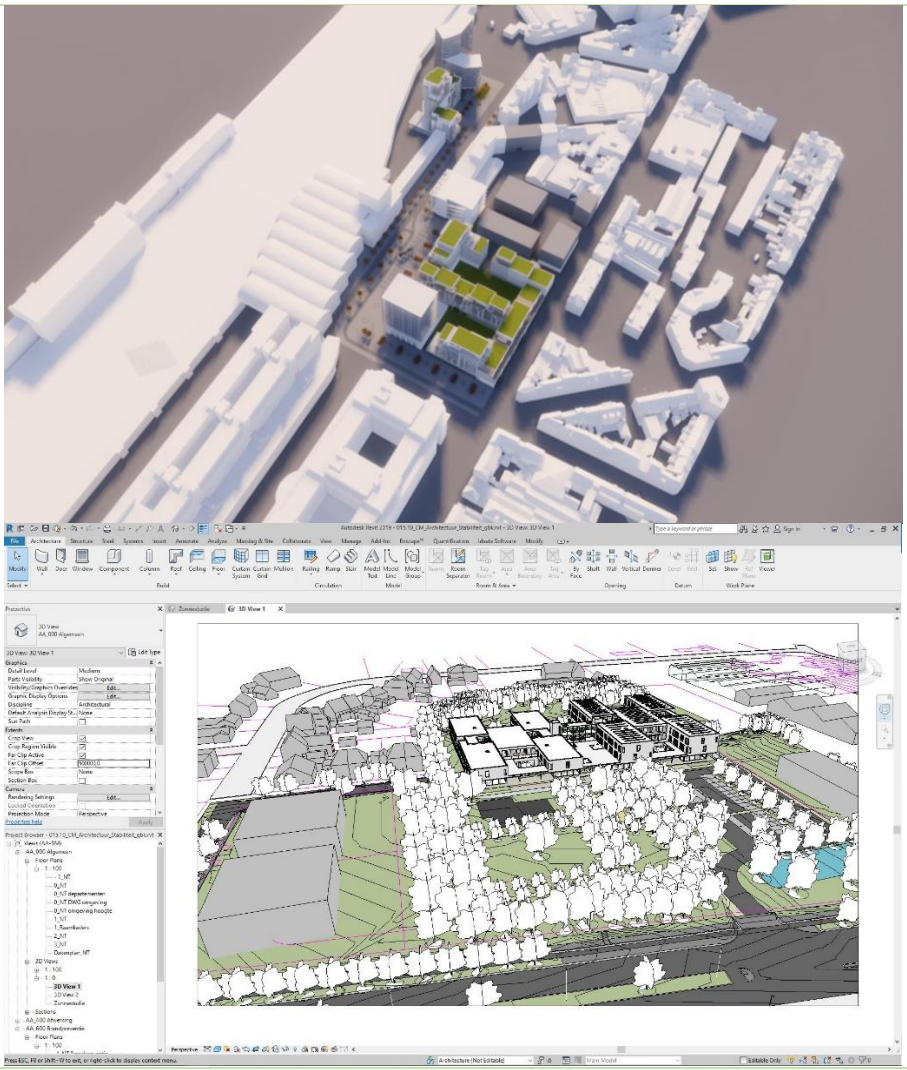
More broadly, it could be either interesting for everyone who has an interest in BIM and is professionally involved in building design, directly (architects, engineers, etc.) or indirectly (city planners, contractors, building owners, etc.)

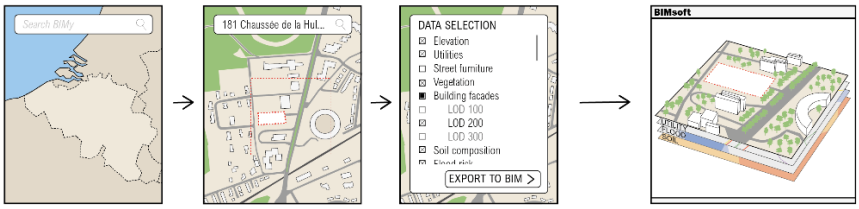
The BIMy project integrates the worlds of BIM and GIS. Both developed independent of each other and have different (active) user bases. This visionary demonstrator aims to pique interest in GIS among building design professionals, by demonstrating how they might be using GIS already (without realizing) and how better integration of the two domains can support their work.

Name of the tool/Application/ similar	**Facilitate integration of urban context into BIM for architectural design**
Link	*To be published*
Partners Contributing	*Assar, Willemen*
Responsible researcher(s) for technical discussions	Geert Bekaert, Assar, gbk@assar.com *Thomas Goossens, Assar,* tgo@assar.com *Lise Bibert, Willemen,* lise.bibert@willemen.be *Dieter Froyen, Willemen, dieter.froyen@willemen.be*
Description	*Urban context is an important source of information for building design and architects lack easy-to-use GIS tools compatible with BIM.* ▪ *Gathering context data:* *Site visit* *Desk research (free online data)* ▪ *Google Maps/Streetview* ▪ *Online cadaster* ▪ *Hiking/cycling maps* ▪ *Activity heatmaps (e.g. Strava)* ▪ *Etc.* ▪ *Improvement through governmental data platforms: GeoPunt, UrbIS, WalOnMap* ▪ *Resource intensive 'digital labor'* ▪ *BIMy as tool for gathering data about project site and surroundings* ▪ *Easy search* ▪ *Large collection of datasets* ▪ *Preference templates* ▪ *Compatible file format*
Target Audience	*Architects*
Dissemination status	***Public demonstration*** *NA*

Statistics	*NA*

Opinions & Feedback	▪ *Advantages*
	  ▪ *Better workflow efficiency*
	  ▪ *Improve design quality*
	  ▪ *Constistent source of data*
	  ▪ *Visualize projects in their environment (without having to recreate it)*
	  ▪ *Lower risk of unforeseen problems during construction*
	▪ *Extended vision*
	  ▪ *Upload created design*
	  ▪ *Access third party apps for analyses and services: line-of-sight analysis, shadow analysis, traffic impact, building permit, etc.*

Snapshots, Photos and Figures	


Search BIMy
181 Chaussée de la Hul...
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LOD 300
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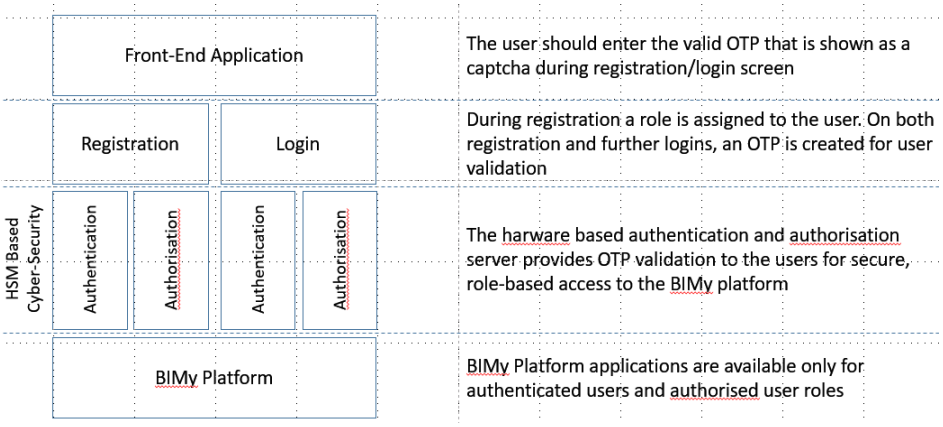
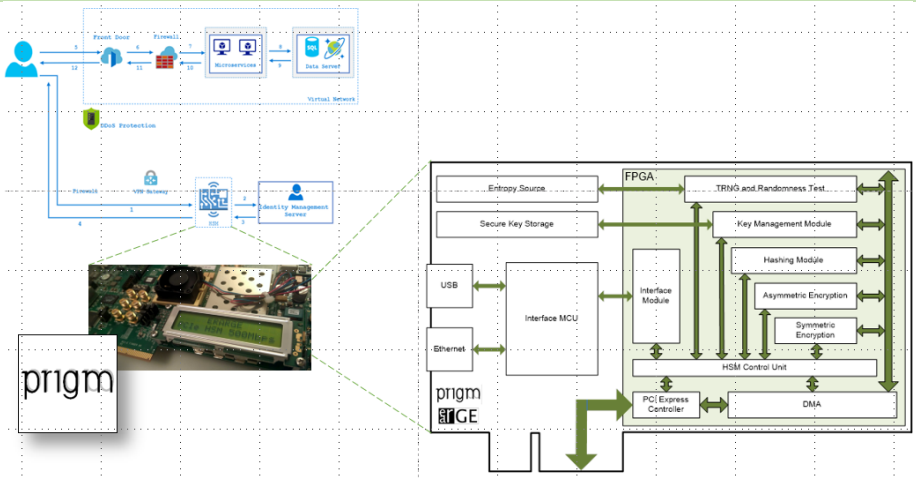
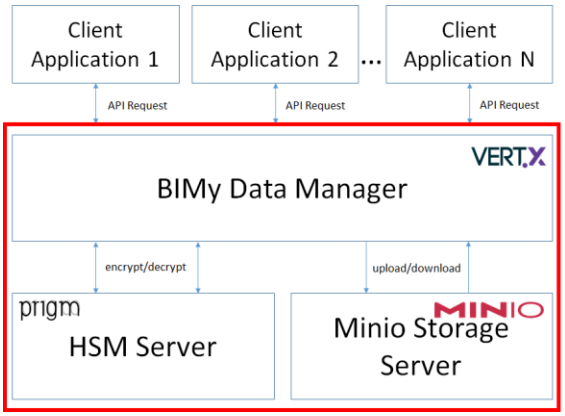
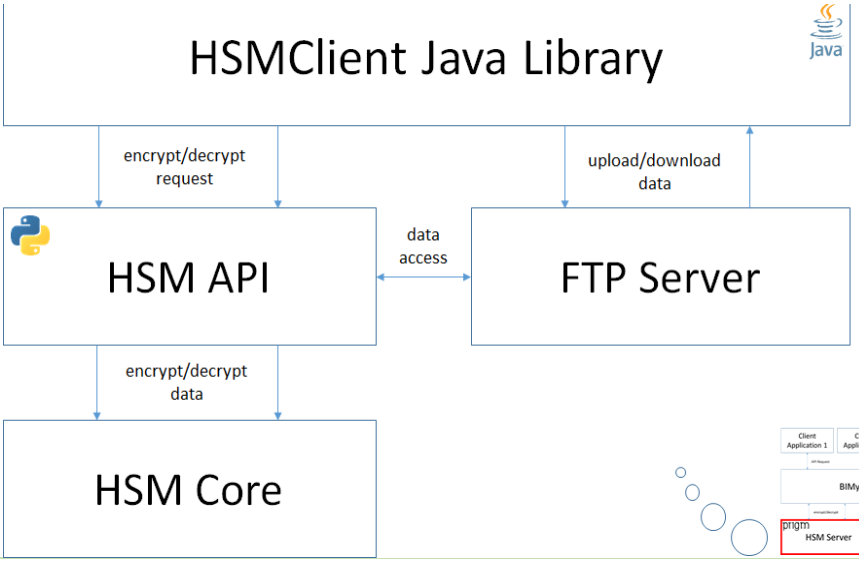
BIMsoft

2.11. Demonstrator (Demo 10) / Security demo

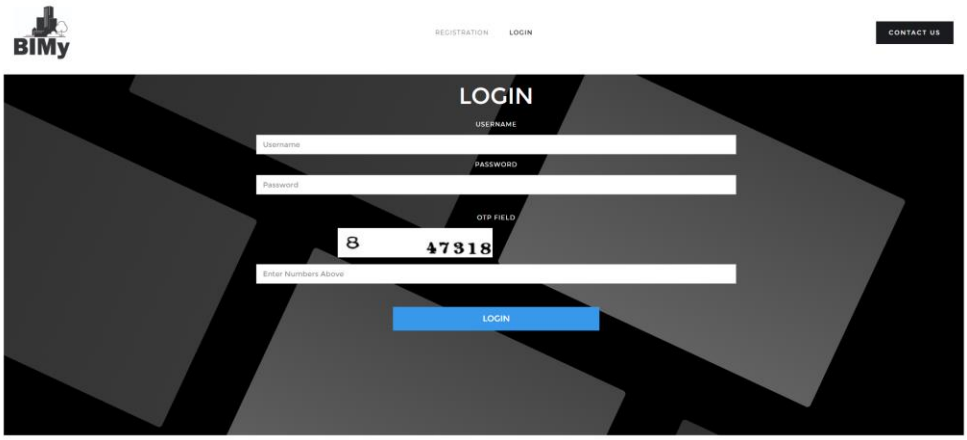
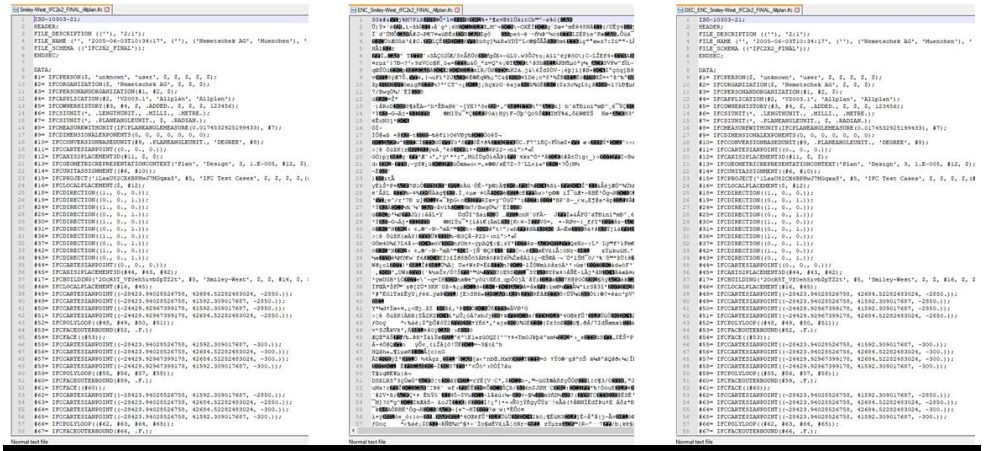
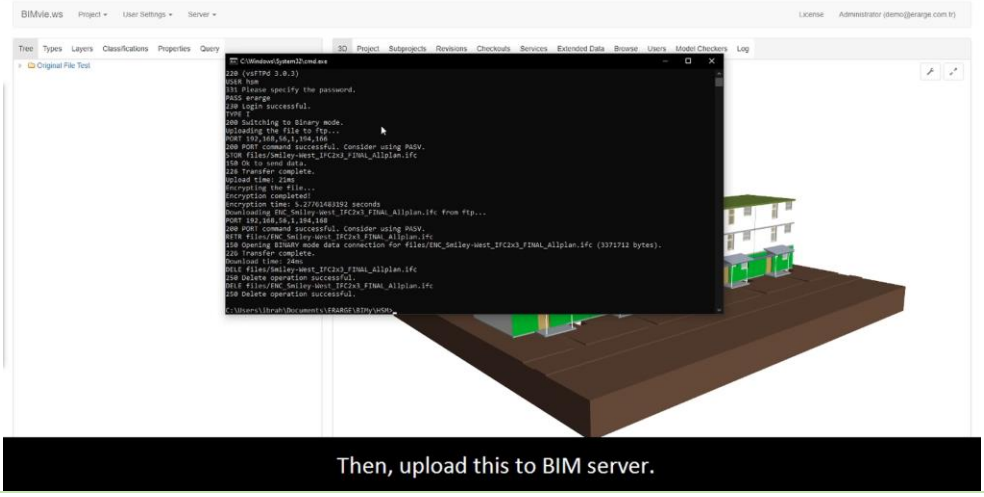
Name of the tool/Application/ similar	**BIMy HSM based security**
Link	https://youtu.be/kF4AEfqVLhE
Partners Contributing	*ERARGE, NETAS*
Responsible researcher(s) for technical discussions	*Alper KANAK* Ph.D., ERARGE, alper.kanak@erarge.com.tr Ibrahim ARIF, ERARGE, ibrahim.arif@erarge.com.tr *Osman Kumaş, NETAŞ,* okumas@netas.com.tr *Nagehan Çakır, NETAŞ,* nagehanc@netas.com.tr
Description	*The Hardware Security Module (HSM) integration to BIMy Platform enables secure authentication and authorisation management via One-Time-Passwords (OTPs) for multifactor authentication, and role and profile based authorization policy. Multiple profiles (Fireman, Building Owner, Architect, Administrator, etc.) are defined within BIMy end-users whilst every user has a role-based (Project Manager, Project Owner, Project Editor, Project User) access to the platform.* *On the other hand, data encryption and decryption for critical BIM models is applied by using AES-128bit algorithm. The BIMy Data Manager controls the encryption and decryption processes before updating and after downloading the model from Minio storage server. Thus, a server-side encryption is enabled on BIMy platform.* *OTP Mechanism:*  *Overall Architecture*

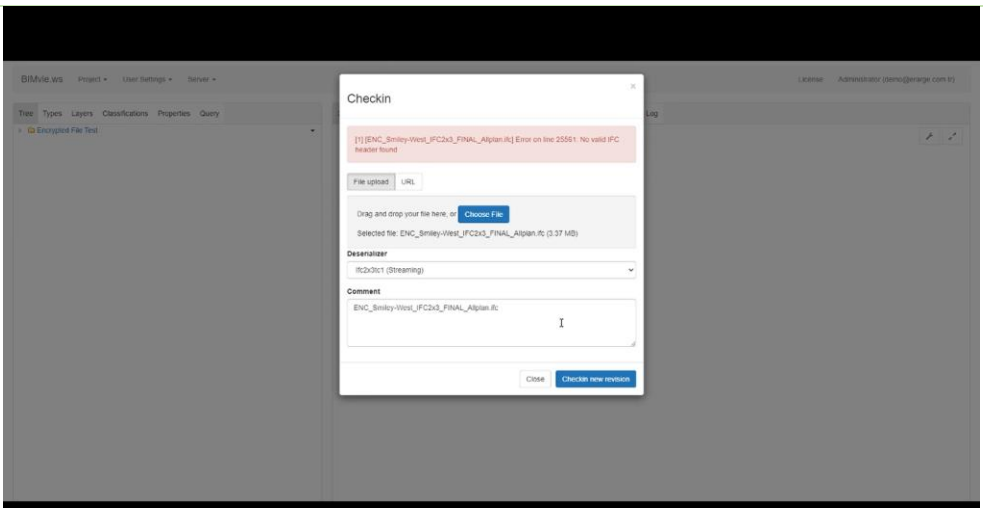


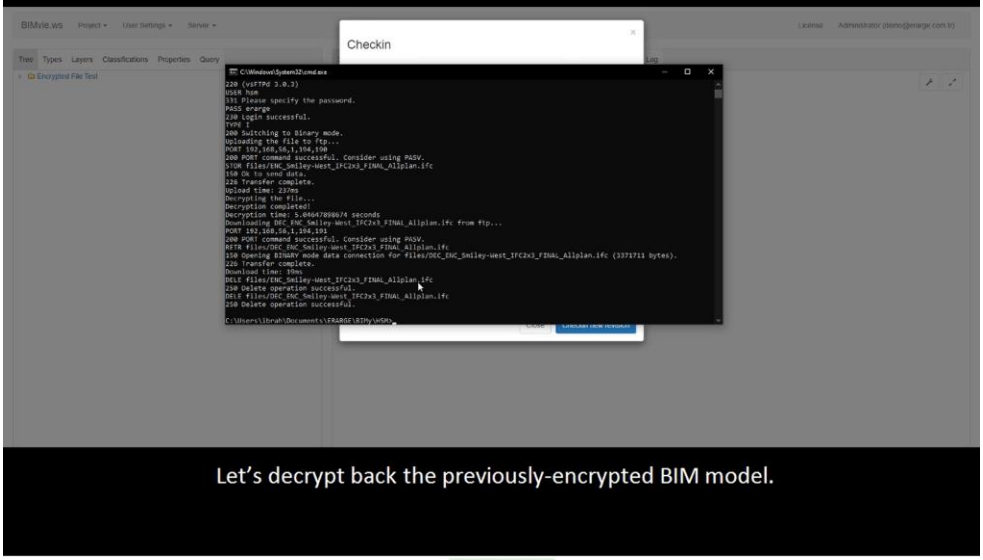


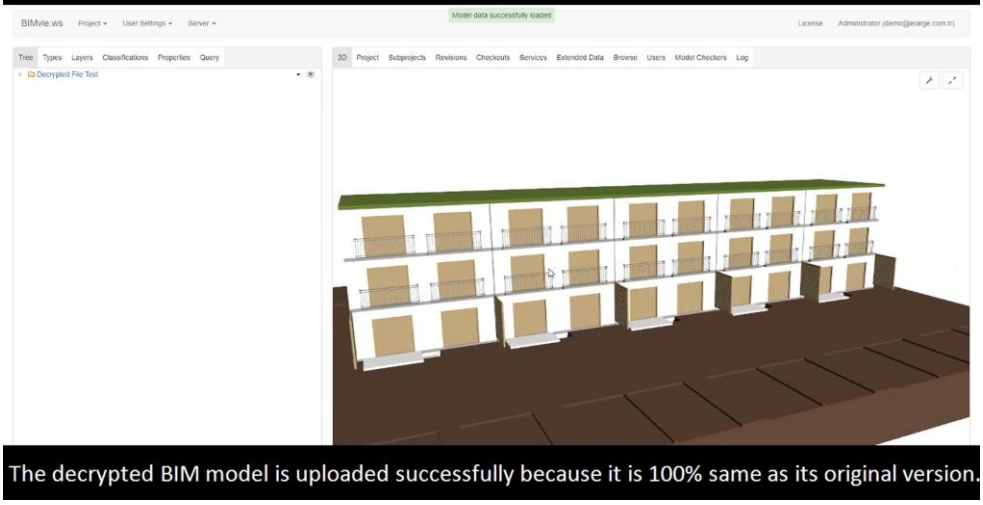


Target Audience	*BIMy platform end-users*
Dissemination status	***Public demonstration***
Statistics	*NA*

Opinions & Feedback	*The HSM integration in BIMy platform reflects positively to its end-users for security policies.* *The optimization of encryption and decryption time continues.*
Snapshots, Photos and Figures	 Original data Encrypted data Decrypted data  


Checkin
The upload operation is failed because the BIM model is encrypted


Checkin
Let’s decrypt back the previously-encrypted BIM model.


The decrypted BIM model is uploaded successfully because it is 100% same as its original version.

3. Conclusion

This deliverable presents an overview of the demonstrated project outputs which are presented during the iteration #1 and #2 (as of June 2020). These demonstrators mainly focus on the fundamental features of the BIMy cloud platform like BIM data filtering, visualization over WEB and basic visualization and interaction with augmented and virtual reality.

Due to Covid19 outbreak and in spite of the unforeseen latencies (including the delivery of this report), BIMy consortium managed the process successfully and and succeed to present influential demonstrators and visionary articles to increase the impact of the project. As contrary to the first year iterations (see D5.1 v1), the demonstrators presented in this report are significantly more collaborative as both Turkish and Belgian partners have worked in coherence.

These demonstrators will be supported in the last iteration where partners will focus more on evaluating the results and collect feedback from the stakeholders. Such a feedback will help BIMy partners to re-elicit and improve their research, marketing and business plans. These revisions will be a baseline for future large-scale projects or products and better engagement in standardisation and public-private partnership projects.

Bibliography

BIMy consortium. (2020). *BIMy—BIM in the City—D4.2 v1 Report for business and exploitation models*.