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R2.2

Needs assessment on current skills needs of the use of BIM at EOL practices

Belgium Report

Centre IFAPME Liège-Huy-Verviers ASBL

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Introduction

Building Information Modelling (BIM) is an innovative and transformative technology in the construction industry, offering a 3D digital representation of the physical and functional characteristics of buildings and infrastructure. BIM facilitates improved collaboration, efficiency, and sustainability throughout the lifecycle of a project, from design and construction to operation and maintenance.

Europe has been at the forefront of BIM adoption, with varying degrees of implementation and maturity across countries. The Directive 2014/24/EU on public procurement, adopted by the European Union in 2014, plays a pivotal role in promoting the use of BIM across Europe. This directive encourages member states to consider digital tools, such as BIM, for public works contracts. The aim is to enhance efficiency, transparency, and innovation in public procurement processes.

A.2.1 has provided detailed research to conform a report on the current status of BIM uses providing an overview of the status of BIM in Belgium, Germany, Greece, Italy, and Slovenia, the countries that are represented in the BIM4D consortium. The second part of the research has been devoted to the use of BIM for deconstruction considering various elements: theoretical perspectives, benefits, current skills needs, challenges, relating policies and links with sustainable waste management.

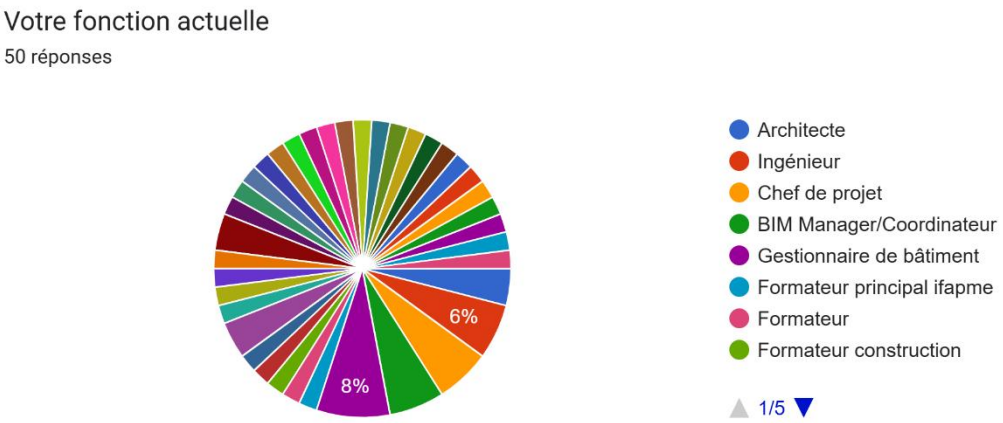
A.2.2 - Needs assessment on current skills needs of the use of BIM at EOL practices has been implemented via a survey to understand the skills required for effectively using Building Information Modeling (BIM) in the deconstruction phase of construction projects and detect skills needs to design the training within the BIM4D project. The survey has been addressed to professionals and companies who use BIM in their regular work or who have knowledge of the topic or who consider BIM an opportunity for their company.

Profile of the participants to the survey

50 people participated in the BIM4D survey conducted in Belgium and the chart below reports the percentage of the current role / position of the participants.

Among the roles listed in the survey, the position of building manager is the most common (8%). Other professions follow closely behind: engineer (6%), BIM Manager/Coordinator (6%), project manager (6%), and architect (4%).

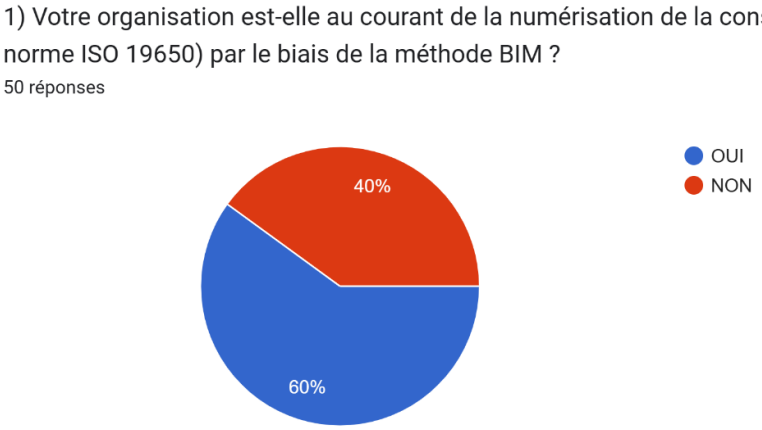
A diverse panel of participants responded to the survey, with the majority (70%) selecting the “other” option to specify their precise role within the construction sector (such as draftsman/BIM modeler, surveyor, consultant, maintenance manager, business owner, etc.).



Presentation of the results of the online survey

Current use / knowledge of the BIM

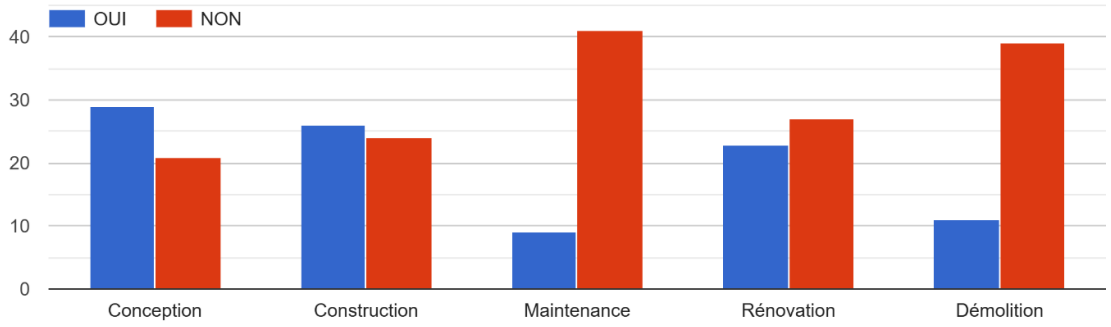
1 - Is your organization aware of the digitalization of the construction supply chain (introduced by the ISO 19650 standard) through the BIM methodology?



Most respondents (60%) indicate that their organization is aware of the digitalization of construction (introduced by the ISO19650 standard) through the BIM method.

2 - Are you aware of or do you even partially use a BIM process in the following phases?

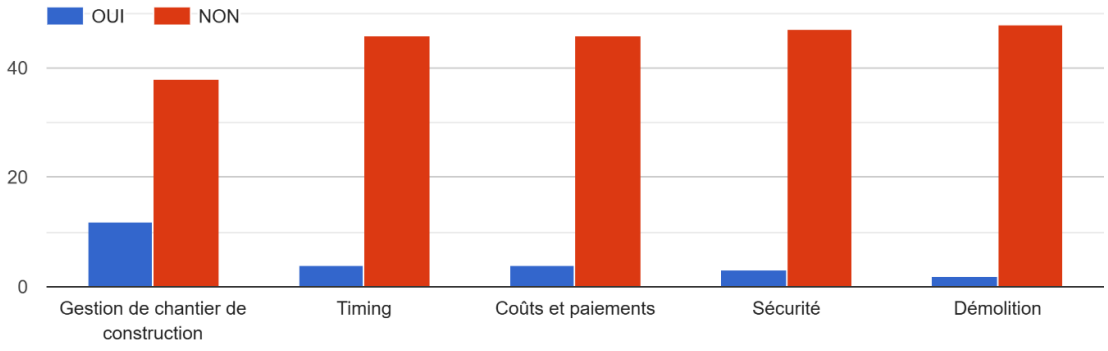
2) Connaissez-vous ou utilisez-vous, même partiellement, un processus numérique dans les phases suivantes :



Most respondents are familiar with the BIM digital process for the design and construction phases of buildings. The use of BIM for the later stages of the building lifecycle, particularly for maintenance and demolition, is less well-known.

3 - Have you ever used a BIM digital twin to manage one or more of the following aspects of a construction project?

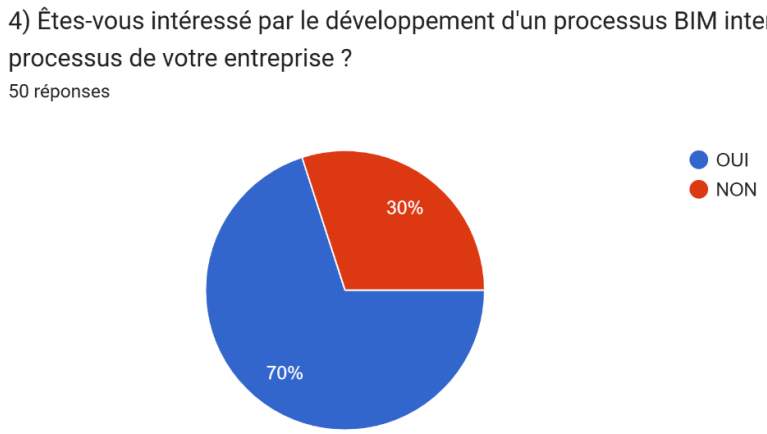
3) Avez-vous déjà utilisé un double numérique BIM (maquette numérique reproduisant le projet sur lequel vous travaillez) pour gérer un ou plusieurs des aspects suivants d'un projet de construction ?



Most respondents have never used a BIM digital twin to manage the mentioned aspects of a construction project. Only construction site management stands out, with 24% of respondents indicating that they have used a BIM digital twin for this purpose.

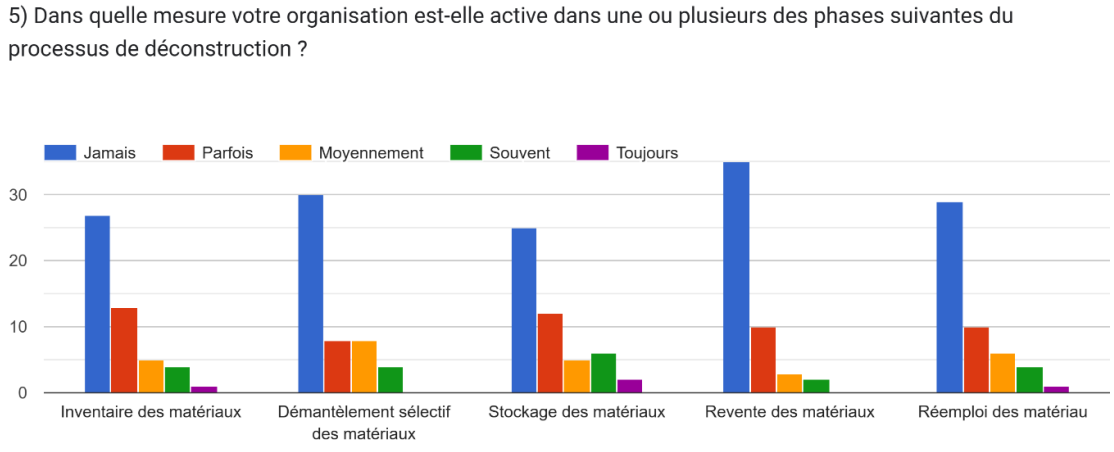
Perspective for the future

4 - Are you interested in developing an internal BIM process to digitalize company processes?



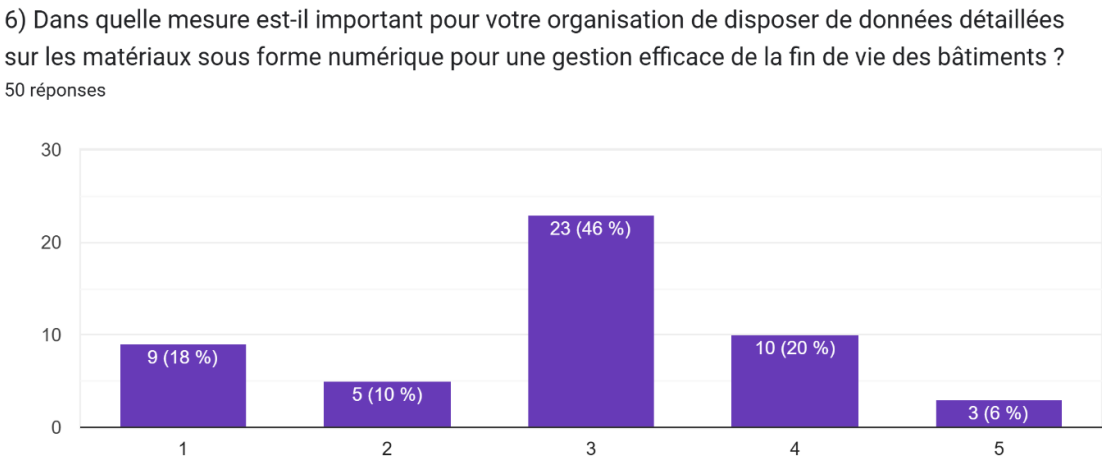
Most respondents (70%) are interested in developing an internal BIM process to digitalize the company's operations.

5 - To what extent is your organization active in one or more of the following phases of the demolition process?



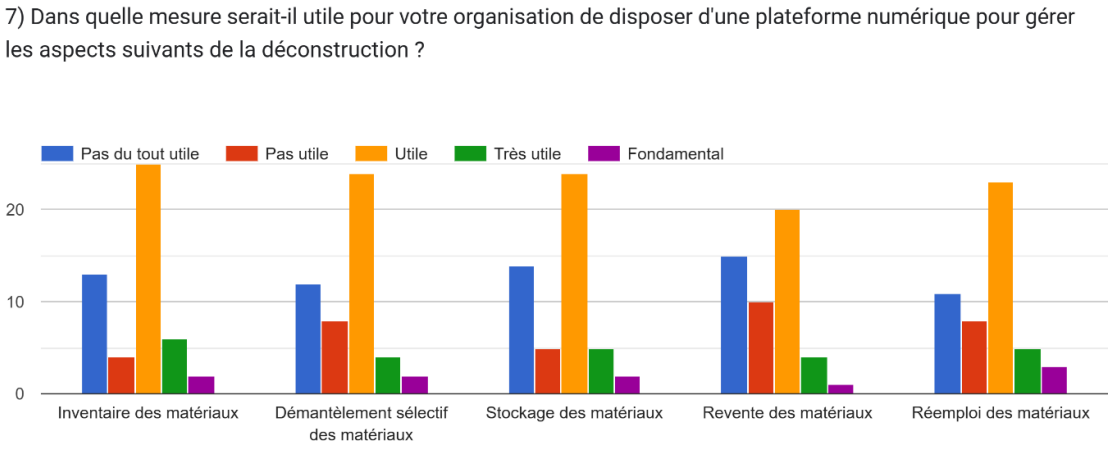
Most respondents are minimally involved in the phases of the deconstruction process, indicating that deconstruction for material reuse is not yet widely integrated into the practices of construction professionals in Belgium.

6 - How critical is it for your organization to have detailed component data in BIM libraries for effective end-of-life management?



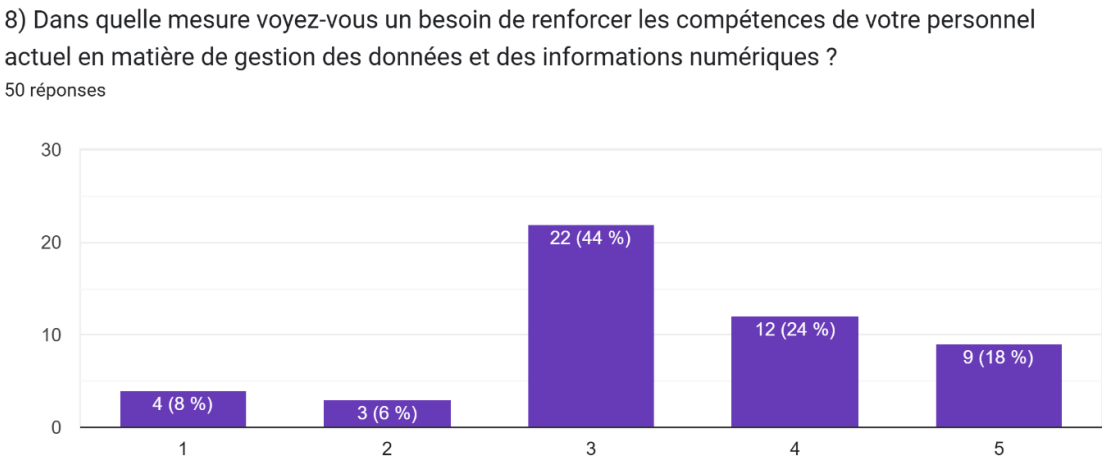
Most respondents (72%) believe, to varying degrees, that it is important for their organization to have detailed component data in BIM libraries for effective end-of-life management.

7 - To what extent would it be useful for your organization to have a digital platform linked to a BIM model to manage the following aspects of demolition?



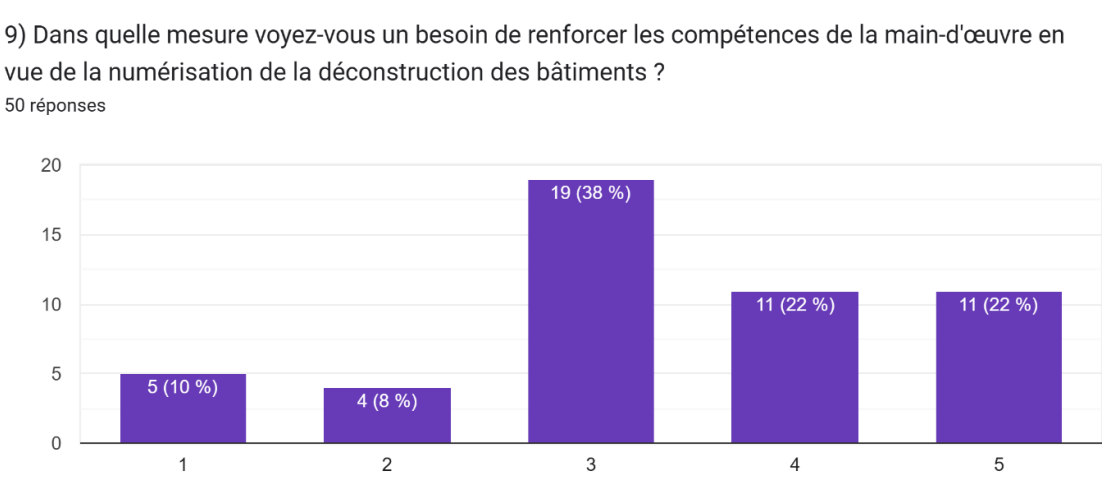
Most respondents indicate that having a digital platform to manage the deconstruction process would be at least useful, if not very useful or even essential. The material inventory phase received the most support.

8 - To what extent do you see a need to upskill your existing workforce in digital data and information management (BIM)?



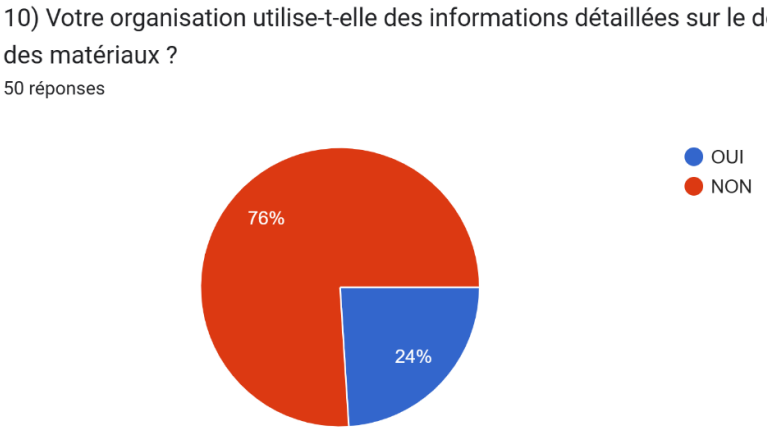
Most respondents (86%) believe, to varying degrees, that there is a need to strengthen their current staff's skills in data and digital information management.

9 - To what extent do you think there is a need for an upskilling of the workforce for the digitalization of building demolition



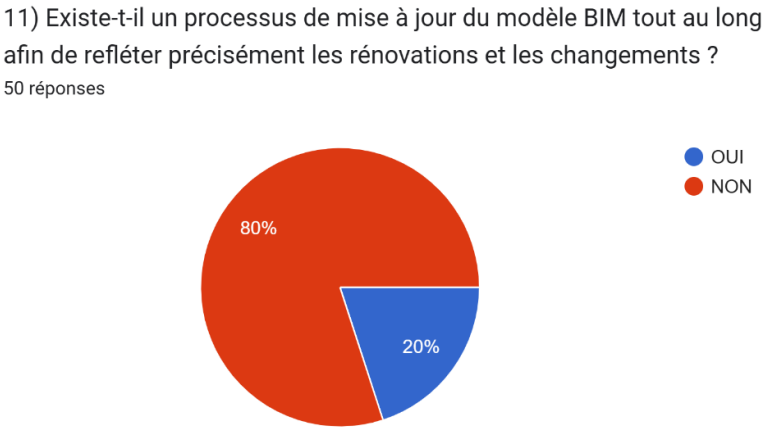
Most respondents (82%) believe, to varying degrees, that there is a need to strengthen the skills of construction workers to make deconstruction more digital.

10 - Do the BIM models used by your organization include detailed information on the disassembly and recyclability of materials?



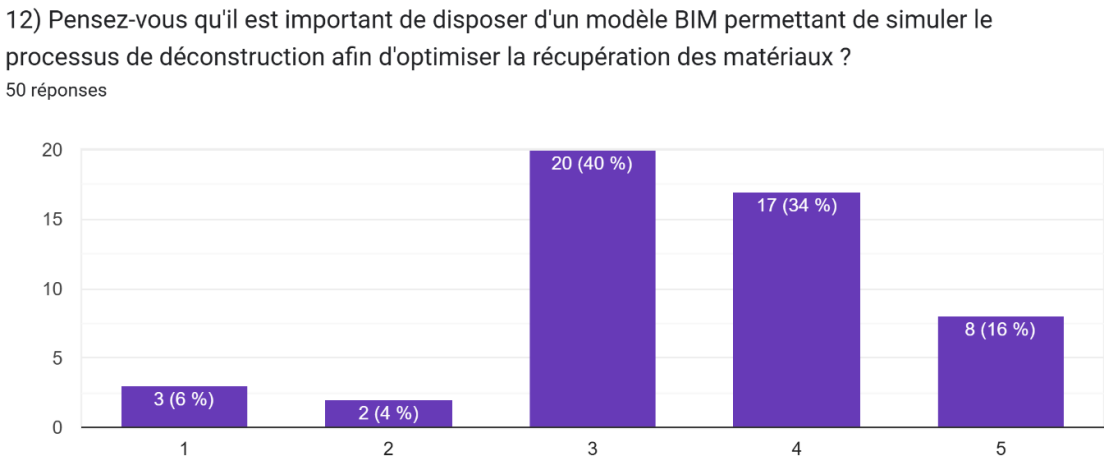
Most respondents (76%) indicate that the BIM models used in their organization do not contain detailed information on disassembly and material recyclability, further confirming the observation that deconstruction and reuse are still in their early stages in Belgium.

11 - Is there a process in place to update the BIM model throughout the lifecycle of the building to reflect renovations and changes accurately?



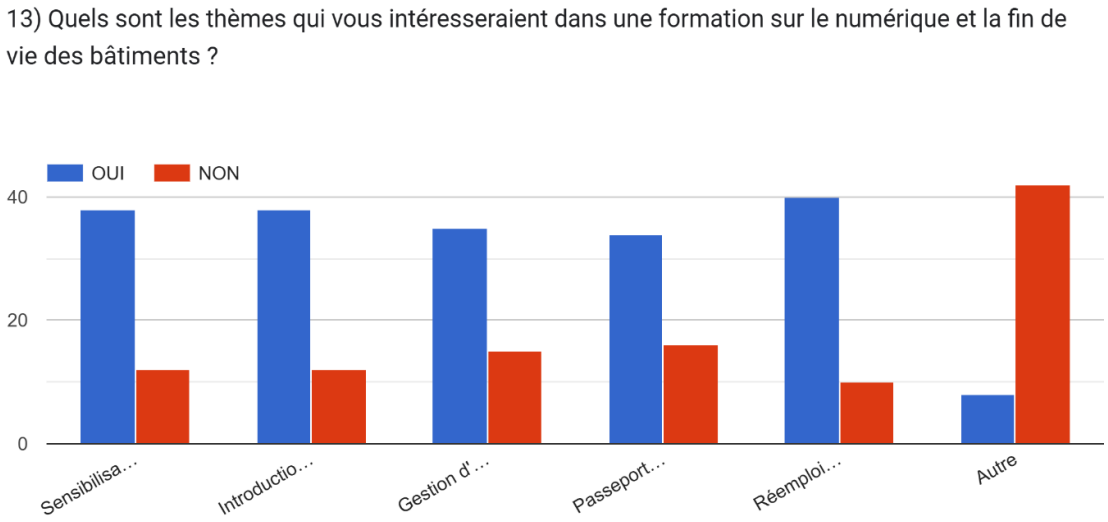
Most respondents (80%) indicate that the BIM models used in their organization are not updated to accurately reflect renovations and building changes. This confirms the previous observation that BIM models in Belgium are primarily used for design and construction phases, with minimal application in later stages of the building lifecycle (maintenance, renovation, and deconstruction).

12 - Do you think it is important to have a BIM model that can simulate the deconstruction process to optimize material recovery?



Most respondents (90%) believe, to varying degrees, that it is important to have a BIM model that can simulate the deconstruction process to optimize material recovery.

13 - What topics would interest you in a training course on BIM and building end-of-life?



Most respondents are generally interested in the proposed training topics, in the following order: reuse of materials (80% of respondents interested), introduction to BIM (76%), introduction to deconstruction (76%), management of an exchange platform (Common Data Environment) (70%), and material passports (68%). Three people who selected “Other” suggested the

following training topics: “circular economy”, “lobbying for a legal requirement of a deconstruction permit as a prerequisite for obtaining a building permit” and “inventory management and material classification”.

Conclusions

The results of the BIM4D survey conducted in Belgium highlight a general lack of experience in BIM and digital processes within construction companies, coupled with a strong interest in the development of these areas and the improvement of corresponding skills. Notably, the use of BIM and digital tools for the end-of-life phases of buildings is largely unknown to most respondents. Moreover, practices related to building deconstruction — such as material inventory for recovery, selective dismantling, storage, stock management, resale, and reuse of materials — are rarely implemented by the survey participants. As a result, the combination of BIM and deconstruction presents a challenge: these are two emerging areas in the Belgian construction sector, but they are not yet sufficiently linked.

The survey findings were presented to participants at the **discussion workshop on deconstruction and BIM** held on 9th October 2024 at Centre IFAPME Liège-Huy-Verviers ASBL (see report for activity A2.3). These findings aligned with the main themes of the workshop discussion, highlighting several key points:

- **Limited Use and Familiarity with BIM**: While BIM is widely recognized in Belgium, its adoption is mostly limited to larger engineering firms and companies, with smaller and medium-sized enterprises (SMEs) generally engaging less with digital processes.

- **Digital Maturity Gaps in the Construction Sector**: The workshop participants pointed to significant gaps in the digital maturity of Belgian construction companies, indicating that many businesses lack the foundational digital skills necessary for BIM integration.

- **Challenges with Older Buildings and Information Access**: There is a strong need for access to information on older buildings, which were not originally designed with BIM, to efficiently plan deconstruction and maximize material recovery. The absence of BIM data on these structures presents a barrier to efficient deconstruction, as it complicates the tracking and reuse of building elements.

- **Need for Targeted Training at Multiple Levels**: It was agreed among the workshop participants that training is essential but should be tailored to the varying needs within organizations. While not every worker needs to master the entire BIM process, it is crucial for all relevant staff members to be proficient users of collaborative platforms in order to access necessary information at the right moment.

- **Training vs. Workforce Shortages and Competing Challenges**: A significant challenge identified in Belgium is the difficulty of finding time to train workers amidst ongoing labor shortages in the construction sector. The industry also faces other major challenges, such as the urgent need for energy-efficient renovations, which demand immediate attention and resources.

In conclusion, the BIM4D survey conducted in Belgium highlights both the opportunities and challenges within the Belgian construction sector regarding BIM adoption and the digitalization of processes. While there is clear interest in developing digital skills and applying BIM throughout the building lifecycle, especially for deconstruction and material reuse, significant gaps in experience, knowledge, and infrastructure remain. To bridge these gaps, targeted training programs and a stronger focus on digital tools for older buildings, inventory management, and deconstruction practices are crucial.