# Team Cohesion Assessment Tool and Learner Capacity to Collaborate as part of a BIM Process

*Evaluation Grids of the collaborative work in the BIM GAME*

# BIM GAME I.O. #4

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# 1 Introduction

BIM Game is a set of training devices on collaboration in a BIM process. For practical reasons, BIM Game focuses on a well-defined phase of a BIM process. The ultimate goal is to be able to train on collaboration in a BIM process.

It is therefore a question of proposing a scenario to a certain number of learners and of providing a set of data, tools and objectives that encourage collaboration between different learners. The digital model can be a central element in the collaboration process.

The scenario may have different stated objectives to push for the development of outputs, but the hidden goal that must be put forward at the end of the scenario is the ability to collaborate.

Therefore, beyond the scenario that could be proposed, the teacher must equip himself with means to evaluate the acquisition of learning at the level of collaboration and not at the level of job skills. Job skills must be prerequisites. This evaluation of the collaboration must also be able to be done whatever the scenario proposed.

# 2 Basis of a scenario

To define a collaborative work evaluation grid, it is important to identify the information that will be provided to the learners for each scenario. For a given scenario, the teacher provides the following documents:

- A modeled BPMN process defining:
    - The different actors;
    - The inputs;
    - The stages of the scenario;
    - The different roles in each step;
    - The outputs
- A descriptive document of the scenario with the declared objectives;
- Fact sheets describing the skills and roles expected of each participant;
- Software to use to perform the different tasks;
- Software to use for collaboration;
- Access to the BIM Game collaboration platform;
- The evaluation grid of collaborative work.

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# 3 The Evaluation Grid

At the level of the evaluation grid, the teacher must be able to evaluate both the collective work and the individual work. This evaluation is done at each stage of the process but also, more generally, at the end of the training.

In the evaluation grid we differentiated three kind of steps:

## 3.1 The first step

*A step of starting and taking control of the scenario, data and collaboration tools.*
*This step comes at the start of the scenario and ends at the end of the first stage of the process.*

The evaluation is based on the following criteria:

- **The capacity to take care of inputs;**
  By inputs we mean on the one hand the documents of the scenario provided to the learner and on the other hand all the data concerning the project including the digital model.

- **The apprehension of collaborative tools;**
  The first step is to check if the learner has a good understanding of how to use the collaboration tools and whether they assess their relevance in effective collaboration with other learners.

- **The use of collaboration tools;**
  In this first stage the learner must be able to integrate the collaboration tools from the beginning. It is a question of evaluating one's ability to open oneself to other learners and not thinking essentially about his task.

- **The structuring capacity of the data;**
  Storage and data sharing is essential for collaboration. In the first stage, the learner must demonstrate his ability to manage the data received which he will produce at the level of collaboration.

## 3.2 The intermediate steps

*All stages of the collaboration process except the first and last steps of the process.*

From the second step the evaluation criteria is clarified and focuses a little more on collaborative work.

- **The ability to share data;**

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The mechanisms and methods put in place for data storage and sharing become an important criterion for good collaboration between learners.

- **Digital model sharing capability;**
  Special attention will be given to the digital model at the level of sharing and communication tools.

- **Relevance in the use of the BIM Game collaboration platform;**
  The BIM Game platform must be able to become a place of communication and important collaboration and be adopted by the different learners.

- **Relevance in the use of communication tools;**
  The choice of communication tools is important to optimize collaboration. Learners can innovate and go beyond the tools offered if necessary.

- **Capacity to create concert halls (physical or digital);**
  This also falls within the framework of communication tools but more broadly in the form of a consultation meeting that can be through digital tools but also more directly during physical meetings when possible.

### 3.3 The final step

*Special step of closing the scenario.*

This step can be assimilated to a step like any other in the collaboration process, with the particularity that it must allow to manage the outputs. In this particular case, the following criterion will be added to the other evaluation criteria:

- **Effectiveness of validation of outputs and their transmission.**
  Verifying that the data produced, including the digital model, have been validated by the different learners and correctly transmitted to the dentists of the project.

# 4 Evaluation methods

The teacher, with the evaluation grid, must be able to follow each learner and give a mark for each criterion and at each stage. At the end of each stage he must also be able to give a collective evaluation in a descriptive form.

This collective and descriptive evaluation will serve two purposes. On the one hand, it will enable learners to better understand their own evaluations in relation to the collective. On the other hand, to allow the teacher to evaluate the scenario used and its relevance in a

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training process on collaboration. If necessary, this will allow it to evolve the scenario for more appropriate future uses.

For the individual assessment, for each criterion the teacher will score between 1 and 3 in order to reduce the subjective perceptions of the assessment. The large number of criteria ultimately makes it possible to have a fairer global vision at the level of the final evaluation.

The final result remaining between 1 and 3, this will give as evaluation:

- 1 for negative evaluation
- 2 for an medium evaluation
- 3 for positive evaluation

The evaluation is not intended to punish the learner, but to show him his strengths and weaknesses so that he can reinforce and improve them.

# 5 Teacher feedbacks

The proposed evaluation system allows two types of teacher feedback:

**A direct feedback** based on the scores obtained and identification of the strengths and weaknesses of each learner. This direct feedback will also concern the descriptive evaluation of the entire collaborative team.

**An indirect feedback** in the form of an essentially descriptive training report for each learner, which will be sent in PDF format and by e-mail a few days after the training.

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# 6 Annex A: BIM GAME Evaluation Report

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# Evaluation Report

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| From : ……. |
| Training Site : …… |
| Scenario : …… |
| Date : /. /. |
| Score : /……. |

Transmitted on : /. /.
By : ……

## ➢ First Step:

- **The Capacity to take care of the inputs ;**

*By inputs we mean on the one hand the documents of the scenario provided to the learner and on the other hand all the data concerning the project including the digital model.*

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- **The apprehension of collaborative tools ;**

*The first step is to check if the learner has a good understanding of how to use the collaboration tools and whether they assess their relevance in effective collaboration with other learners.*

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- **Using collaboration tools ;**

*In this first stage the learner must be able to integrate the collaboration tools from the beginning. It is a question of evaluating one's ability to open oneself to other learners and not thinking essentially about one's task.*

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- **The ability to structure data ;**

*Storage and data sharing is essential for collaboration. In the first stage, the learner must demonstrate his ability to manage the data received and that he will produce at the level of collaboration.*

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## ➢ The intermediate steps

- **The ability to share data ;**

*The mechanisms and methods put in place for data storage and sharing become an important criterion for good collaboration between learners.*

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- **Digital model sharing Capability ;**

*Special attention will be given to the digital model at the level of sharing and communication tools.*

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- **Relevance in the use of BIM GAME Collaboration Platform ;**

*The BIM Game platform must be able to become a place of communication and important collaboration and be adopted by the different learners.*

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- **Relevance in the use of communication tools ;**

*The choice of communication tools is important to optimize collaboration. Learners can innovate and go beyond the tools offered if necessary.*

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- **Capacity to create concert halls (physical or digital)**

*This also falls within the framework of communication tools but more broadly in the form of a consultation meeting that can be through digital tools but also more directly during physical meetings when possible.*

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## ➢ The final step

- **Efficiency of the validation of the outputs and their transmission.**

*Verifying that the data produced, including the digital model, have been validated by the different learners and correctly transmitted to the person in charge of the project.*

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## ➢ The assesment of overall strengths and weaknesses :

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*Signature :*
*(Name / surname)*

# 7 Annex B: BIM GAME Evaluation Grid

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# Evaluation Grid

| | | Player 1 | Player 2 | Player 3 | Player 4 | Player 5 | Player 6 | Player 7 | Player 8 | Team |
|---|---|---|---|---|---|---|---|---|---|---|
| Step 01 | Support Capacity of Inputs | | | | | | | | | |
| | Apprehension of collaborative tools | | | | | | | | | |
| | Using collaborative tools | | | | | | | | | |
| | Data structuring capacity | | | | | | | | | |
| Step 02 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |

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| Step 03 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |
| Step 04 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |

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| Step 05 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |

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| Step 06 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |

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| Step 07 | Data sharing capability | | | | | | | | | |
| | Sharing capacity of digital model | | | | | | | | | |
| | Relevance in the use of the BIM Game Collaboration Platform | | | | | | | | | |
| | Relevance in the use of communication tools | | | | | | | | | |
| | Ability to create concert halls (physical or digital) | | | | | | | | | |
| | Effectiveness of validation of outputs and their transmission | | | | | | | | | |
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Evaluation between 1 & 3 for each criterion

BIM GAME

An individual report identifying the strengths and weaknesses of each learner will be communicated later