Dear Sir or Madam,

Thank you for the valuable feedback.

We appreciate the effort and time you invested to improve our paper. The reviews we received offered detailed feedback that contributed to the revision process.

We have carefully examined the reviews, revised the paper accordingly, and explained our adjustments in detail below. In essence, the current status of KBXAI-PA (Section 4) has been presented in more detail and illustrated with a consistent example. Figure 1 has been separated, and a formalized algorithm for reconstructing the result paths has been added. Furthermore, in the demonstration in Section 5, reference was made to the implemented XUI components in the respective paragraphs. The evaluation was supplemented by further expert interviews that have taken place in the meantime and discussed the evaluation results more critically.

If you have any questions or concerns, please do not hesitate to get in touch.

Kind regards,

Anne Füßl

	COMMENTS		*RESPONSES*
Review #1	1)	It is unclear what is the role of machine learning in the proposed approach. I understood that, by machine learning, the authors mean Inductive Logic Programming. That is completely fine. ILP is an useful machine learning method. However, it is unclear to me how ILP is used? Is it in Layer 2 to abstract the horn-like rules they present in the paper? In page 9, the authors write: "The system prompts the user to check and correct the calculation formula of the result node. In this case, the calculation formula r(v) of the node v(onlineBookingEngine) must be specified in a domain-orientated (SIC. Domain-oriented would be better) manner by expanding it by adding customer data in relation to a booking request. The calculation formula must therefore be adapted as follows (additions in bold): r(vonlineBookingEngine) = ← (r(venterData) && r(vcustomerData) && r(vbookingRequest) == true". The first sentence of this passage is ambiguous: is the user supposed to update the formula (not realistic) or does learning (formulate repair) kicks in here? Still related to this topic, sometimes in the paper, the authors talk about ML and ML experts, etc. Are they referring to ML in general, to ILP, something else?	The use of Inductive Logic Programming was added in Section 4.1, in the architecture description, and reference was made to the initial model by Füßl 2016. ML experts are human analysis experts who have expertise in both graph architecture and process analysis and who check results and automatic adaptions during the training phase before the process analysis tool is deployed in a live environment. The testing also includes adapting result expressions that are stored in a cell to identify weak points in a process model. After the initial training phase, this manual checking procedure is no longer necessary. In the presented example, the adaptions of the result expression were made automatically by ILP. The revised sections in the paper can be found on pages 8, 12-13.
	2)	There is some oddness in reconciling the results and prescriptions made in section 2 and what the	In Section 2, design principles for XUI describe interaction strategies and suitable

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Review #1		authors are set out to do. Section 2 basically reduces the discussion of interaction to features – which is odd when one is primarily focused on explaining symbolic artifacts - I see that features are assembled in layer 3 but this should be much better explained. Another weakness in section 2 is that it assumes too much from the reader who is interested in NeSy systems but who is not necessarily knowledgeable of the literature of XAI. There are many technical terms used here without explanations (e.g., why-explanation, global and local explanation, counterfactual explanation, feature relevance, etc.).	design proposals. They involve different design-oriented forms of explanation and content types of explanation that are not limited to features. A thorough explanation of the terms utilized in Section 2 has been provided, see pages 3-4.
	3)	The empirical evaluation presented is too thin and preliminary. They have interviewed six experts in a qualitative evaluation without a clear frame of comparison to alternatives. In page 13, they write: "A broader evaluation with various case studies and a larger survey participation is in preparation." Perhaps we should wait for those results? The issue is that many of the claims of this paper are empirical claims (in p.9, the results are supposed to be "easily readable, comprehensible and understandable").	The evaluation was expanded by additional respondents who were interviewed in the meantime and further discussions, see pages 19-23.
	4)	Section 2 is an interesting result. However, it is frustrating that the mapping study does not look at explanation from a broader and more critical perspective. There is an immense literature on explanation that goes beyond explainable AI. According to this literature, some of these typical XAI strategies should not even be considered valid explanations, since they don't satisfy the most basic requirements for explanation. A paper that could be useful in this respect is (https://www.sciencedirect.com/science/article/pii/S0169023X24000491). In particular, because it also defends the need for explaining symbolic artifacts, as the authors are pursuing here.	Thank you for the recommendation! Unfortunately, the recommended article had not yet been published when the article was submitted. Section 2 has now been expanded to include XAI basics and explanations, taking into account the linked article, see page 2-4.
	5)	Now, here is my main issue with the paper as it is: section 4. The explanation given there is way too succinct, cryptic, and hard to understand. The authors should spend time elaborating this (absolutely central) section of the paper. I think a running example (e.g., the one used in section 5) could help. They should better explain why this 5-layered architecture, and what really happens inside each of the layer. How is the analysis from 4 to 3 happens (algorithm 1 and its subsequent description are far from enough), how are the rules in L2 formed, verified and revised, how are	Section 4.2 is described in more detail by using an example process model. Furthermore, the explanation process is clarified in more detail using a supplementary illustration and pseudocode for reconstructing the result paths, see Section 4.3.

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	the paths constructed what exactly is the algorithm here?), and so on.	
Review #1	6) In 5.1, given that we have two profiles here (administrators and domain experts), I was expecting to see at least an illustration of different explanations to these two profiles	The distinction between different views is given. The output of the log data is part of the administration view, the view of the analysis results corresponds to the process analysis view. An illustration of the prototype's dashboard, which shows the different views, has been added (see Figure 5, page 14). Moreover, the different views in Figure 5 of the submitted version were separated into two figures (now Figure 8 and 9) and are described in more detail. Finally, an excerpt of the analysis report with analysis results and path runs in the form of decision trees is added and described at the end of Section 5.2.
	7) P18: "In summary, it can be stated that different forms of explanation can support the explanatory power in the sense of comprehensible results." -> True. However, the true discussion here shouldn't be restricted to the concrete syntactical form of explanation presentation (e.g., visual, textural or tabular). The literature of explanation is rich on different understandings of what an explanation is. For example, one could combine pragmatic explanations with metaphorical and unificatory ones (again, the paper I mentioned above can perhaps help connecting to this literature).	Thanks for the valuable thought! In the conclusion, an outlook is given on the consideration of philosophical explanatory approaches in subsequent evaluations.
	8) P6: "ontologies frequently permit modeling flexibility, which enables the interpretation of modeled content and, consequently, makes the generic utilization and extension of the ontology for process analysis more challenging." -> I honestly don't know what the authors mean here. Ontologies are supposed to excluded unintended interpretations of content, not permit flexibility. The authors then continue "In such domain-specific cases, Noy and McGuinness propose the creation of an ontology from scratch". I still don't understand how this connects to the previous sentence. In any case, Noy and McGuinneess' paper was meant as a very-basic introduction to ontologies (hence the title 'Ontology 101') not as a methodology for ontology engineering.	The paragraph was clarified and concretized, see page 6, line 50.
	9) P9: "If, after three evaluation cycles, the value of the weighting of a result node assumes the value −1" -> Why three cycles?	The number of evaluation cycles is utilized during the initial training phase and can be altered depending on the necessity for correction, see pages 12-13.

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Review #2	1a. The first bit of an example is in Figure 1 - but little context for this example part, "explanation user interface," is provided. I would highly recommend that the authors consider a true running example, (e.g., a shaded boxes describing the example, or calling out when you are describing an example with italics and sub-headings "Example 1", etc.). This would make the scenario being described much clearer.	As previously noted in review #1, comment 5, Section 4 was supplemented by a pertinent example. Furthermore, the contents of Figure 1 have been shortened and separated, and made more concrete by additional figures (No. 2-3).
	1b. Figures 2, 3, and 4 are illustrative examples, but are they all in the same scenario? Are they in the same scenario as Figure 1? This is not very clear. Again, here it would be of great benefit to have a running example, and unify figures 1-4 around a single contextual scenario that is presented to the reader.	The issue should have been resolved by the added example as mentioned in the answer above.
	1c. How does the example relate to the UI in section 5? It would be good to both mention (in section 4) how the design components interact with the overall system and perhaps continue the example in section 5 to point out how the design components make an impact.	The example in Section 4, which has been completed and expanded, serves to explain the current architecture of KBXAI-PA. Section 5 introduces a new process model for evaluation purposes, see Figure 6.
	2. The paper appears dis-joint. The XUI components described in section 3 are not mentioned in section 4. Section 4 is very technical, and the reader needs to better understand the context of this technical information with respect to XUI.	Section 4.3 has been expanded to provide further details on the XUI, while concrete implementations of design components are presented in Section 5 during the demonstration and in Section 6 of its evaluation.
	3. Regarding the selected design components, there is no discussion of how the design components are selected (which would have made section 3 seem more integrated in to the paper) and now discussion of how parts of the prototype implemented the specific design components (this would link section 5 back with the earlier portions of the paper).	The selection of the implemented design components was justified in Section 5, page 13. In sections 5.1 and 5.2, which describe the components implemented during the demonstration, references and explanations of the selected components have also been added.
	4. I think there should probably be more discussion on the design component feedback from the users - I think the paragraph starting on line 10 (section 15) is a good start (though you should continue to use the x_ numbers for reference), but I think the analysis should be more in-depth. Did the authors have thesis as to why some of the components seen less often in the literature were viewed as more relevant to the users? Was it due to the specific scenario the users were looking at, or was it that the literature did not address XUI in the context of a logic-based system? Was the selection of those due to some hypothesis that	Many thanks for the insightful thoughts! The recommended discussion points have been incorporated into Section 6.1 on page 19.

	COMMENTS	RESPONSES
Review #2	they would be particularly relevant? These are the types of questions that would be interesting for discussion.	
	5. Overall, the ML feedback mechanism, while simple, should be discussed further in section 4, and also how it impacts user interface design in section 5. Likewise, the survey results relating to ML should be linked back to these points.	Section 4.4 (Interactive learning and assigning weightings) has been expanded and accompanied by the inclusion of a new figure (Fig. 3).
	6. Additionally, there were some small mistakes: In figure 1, the authors mis-spell duplicated (dublicated). Line 23 of page 14 starts with a number (write out the word to start a sentence).	The issues have been addressed as follows: → see Figure 1, page 7 → see page 19, line 15
Review #3	The paper tackles the role of Explainable AI methods in providing human-understandable explanations about the algorithmic decisions within a system. The authors investigate the design of user interfaces for explanations (XUI) for results in applying AI techniques. First of all, it is not very clear to which AI results the authors refer to. I might guess that they refer to applying process mining for analyzing event logs. (p. 2 lines 15-19) or is it how the business processes are checked for deficiencies and improvement measures by using To-Be knowledge stored in knowledge graphs? (p. 2 lines 20-22). It seems that the later might be more plausible based on the presented use case. This should be clarified from the beginning and also a more detailed description should be considered when presenting the process analysis procedure.	Many thanks for the valuable input for improvements! The content of Section 4 has been extended and deepened significantly: • references are made to inductive logic programming as ML technology • a consistent example was chosen to explain the analysis process • the explanation process was described in detail using the reconstruction algorithm in the form of pseudocode Please also refer to the commentary and responses to review#1: 1 & 5, and review#2: 1a & 1b.
	The authors performed a literature review in order to set a design catalog for XUI. It seems their research was limited to identifying XUIs that employed IML methods, although other methods can also support or replace IML in building effective XUIs, among which knowledge-based systems are quite efficient in providing path disclosure for reasoning results. This is a bit strange since they also employ a KB approach. On which basis was the following statement made, since the performed literature review was for another purpose? "A review of the literature revealed no freely available knowledge base in the form of an ontology that would be suitable for identifying weaknesses and improvement measures in business process analysis" (p.6 lines 13-14)	The literature review utilized for the identification of XUIs does not exclusively encompass IML methodologies; it also incorporates XUIs that exhibit some form of interaction. The additional restriction of the search string to include knowledge-based systems would have limited the search too much at the time of the literature search. The argumentation for identifying existing knowledge bases on process analysis criteria, associated weaknesses and improvement measures is not related to the literature research on XUIs; rather, it concerns the development of KBXAI-PA (see "Current state of KBXAI-PA", Section 4).

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Review #3	Further, having the knowledge base with nodes and relationships, it is not clear which is the mechanism that enables the "activated elements of a process". The authors must present more precisely in which way "Different paths are traversed in a domain-specific knowledge graph during process analyses."(p.8 line 17). I believe this is very important, especially for a paper that treats XAI solutions. The use of mathematical formalism might be intimidating in presenting the entire path navigation. This could be done by presenting the traversal route as small, digestible rules which are sequentially triggered. What triggers them must also be clearly presented. One or possible multiple scenarios should be better described (including a BPMN or Petri Net diagram) to understand the process analysis.	The extensions to the process analysis procedure (4.2), the explanation process (4.3) and the use of a consistent example, a more detailed description of the analysis sequence (Algorithm 1), and a formalized algorithm for reconstructing result paths (Algorithm 2) are intended to adequately address the suggestions for improvement.
	The presented use case is not clearly explained: the diagram depicted in Fig 3 is erroneous and it does not seem that the authors made the mistakes on purpose (a tool like SAP Signavio would identify the errors). Moreover, the knowledge graph, as well, is not very clear – one should easily identify the entities and the schema elements, preferably with popular notations (rectangles for literal values, circles for nodes, distinguishing individuals' nodes from classes' nodes through a color): what are hexagons? What are rhombs? circles? ovals? What's the relationship between them and the numbers visible on some of the edges?	The analysis of process models with KBXAI-PA does not consider syntax errors. The BPMN model of the demonstration (Figure 6) is adapted and refined accordingly. The different views in Figure 5 of the submitted version were separated into two figures (now Figure 8 and 9) and are described in more detail. The element types of the knowledge graph are introduced and explained in more detail in Section 4.1 as well as in Figure 1. The labels of dashed edges in the knowledge graph, which represent *Constraints*, serve to denote stored calculation formula. The number that follows the symbol "#" in these labels corresponds to the identifier of the specific node, see page 15.
	Other minor remarks: some pleonastic expressions: "human-understandable XUI" (p.2 line 27), possible small typos like "is" instead of "its"?(p7 line 7); missing abbreviations (e.g. LIME p.4 line 19)	Following adjustments are made: → understandable and intuitive XUI → Here it concerns the associations class 'is' → LIME: local interpretable model-agnostic explanations