Review report for "Expertise and knowledge: a modal logic perspective"

Summary:

The paper extends the modal framework of expertise of Singleton (2021) to reason about the expertise of sources and soundness of information. To achieve the goal, two frameworks are presented: a basic one for the expertise of a single source, and the other for multiple sources. For the basic design, the work explores transformation between the logic on some special models and epistemic logics S4 and S5, and gives sound and complete proof systems w.r.t. several classes of models. For situations with multiple sources, the work designs the language and semantics. Finally, the work also proposes several further directions to be studied.

General evaluation:

The subject matter of the work is interesting. The paper is well written. Also, the author(s) gives an additional web link to some proofs of results in the paper. I did not check some proofs, but what I have checked is technically sound. I would like to see the paper to be published, but some serious problems need to be addressed first.

Main points:

1. But I hope the paper can explain clearly to what extent it extends the work of Singleton (2021) and what the new contributions of the paper are (other than just an "extension" of that paper). I found that some contents of the paper are just simple adaptions of contents in Singleton (2021), e.g., Example 1. This is my main worry: if the paper is a work of the same author (or it is a journal extension of Singleton, 2021), then I think it is OK, given that the work does extend Singleton (2021) substantially; but if they are of different authors, then the paper should change all the contents that are close to that of Singleton (2021) before being accepted.

   i think this can be ignored, s

2. Also, I think that the title "Expertise and knowledge: a modal logic perspective" is confusing in some sense. It may make one think of a logic on both expertise and knowledge, but the main contribution of the paper is logics just on expertise.

   possible alternative: "Expertis

3. My third worry is whether there is any inconsistency between the logical designs and the example used in Abstract, which states that "if a source has

expertise on φ but not ψ, when the conjunction $\varphi \wedge \psi$ is sound whenever φ holds, since we can ignore ψ (on which the source has no expertise) ".

It looks that the example in Abstract aims to argue that the principle '$E\varphi \wedge \neg E\psi \wedge \varphi \rightarrow S(\varphi \wedge \psi)$' is valid, but it is not hard to construct a counterexample to it.[1] This makes me doubt whether or not the logical design developed in the paper really captures the example in its motivation. Definitely, it may become valid if we restrict the class of models, but what the desired conditions should be? Crucially, given that the frameworks of the paper are extensions of the framework in Singleton (2021), can the restricted conditions imposed by Singleton (2021) ensure the validity of the principle (I did not check this)? If so, I think the author needs to change the example used in the Abstract and explain more on what the merits are to generalize the framework of Singleton (2021); if not, then I still think it would be nice if the author weakens the statements that may make readers think the formula is a validity or gives a better example to match the logical design.

Minor Points:

1. Page 5:

   Example 2: As Singleton (2021) requires that in every model (X, P, V), we always have $\emptyset, X \in P$, it makes sense that Singleton (2021) emphasized that $\emptyset, X \in P$ although they are not drawn in the picture of that paper. But the article does not have those restrictions on models any longer, and so, what is the point to emphasize that $\emptyset, X \in P$ in the model constructed in Example 2 and the corresponding Figure (even though $\emptyset, X$ are not drawn there)?

2. Page 9: the paragraph below the semantic clause for $K\varphi$:

   The sentence "means that the sources considers y possible...". Replace "sources" with "source".

3. Page 13: Table 1:

   The font of operators S and E in formulas (W_E) and (W_S) are different from other occurrences of the operators.

4. Pages 26-27: References

   "Dastani, M., Herzig, A., Hulstijn, J., Van Der Torre, L. (2004). Inferring trust. Clima (pp. 144–160)":

   The names of the third author is "van der Torre, L.", other than "Van Der Torre, L.".

[1] Say, consider a model $M = (X, P, V)$ where $X = \{1, 2, 3\}$, $P = \{\{1, 2\}, \{1, 3\}\}$, $V(p) = \{1, 2\}$ and $V(q) = \{2, 3\}$. Then $M, 2 \vDash Ep \wedge \neg Eq \wedge p$, but formula $S(p \wedge \neg q)$ is false at 2, since the truth set of $p \wedge \neg q$ is $\{1\}$: it is a subset of $\{1, 3\}$, while 2 does not belong to $\{1, 3\}$.

"Singleton, J. (2021). A logic of expertise.":

The information is not complete.

Conclusion:

As a consequence, I consider that if the paper is a journal extension of Singleton (2021), then the paper can be published after the above issues are addressed.