# Implementing properties of properties (.1) by using has note (p3)

Frequently scholars and scientists would like to express more detail about a particular relation (property) between two entities than the type of the property itself expresses. These may be more details about the respective role or attitudes or arguments about the reliability of the information. In order to formally attach notes to properties in the currently dominant knowledge representation languages, one needs to replace the property by an equivalent path with an intermediate, auxiliary entity. Even though this mechanism has been provided for the CRM as "[property classes](http://www.cidoc-crm.org/sites/default/files/Roles.pdf)", depending on the implementation choices, this may increase the complexity of the model and the user interface and decrease the performance of respective databases. The details given are in most cases not relevant in order to filter a large set of data by it. In that case they are relevant for the receiving user, but not for querying, and hence can be better expressed in a textual note.

The question that arises is where to put the note, if not to an intermediate entity: to the domain instance or the range instance of the respective property. This is often intuitively done in the opposite way it should be done.

For instance: "Building house X"(E12) - P4 was carried out by - "John Smith"(E21)- P3 has note: "in the role of designer" sound perfectly logical, but is wrong!

This is the effect of context-free propositions in KR. The user sees the local context, but the note is attached to the person, not to the building activity. The role however does not hold for the person at all times, but only for this person in this activity. If "John Smith" will have another role in another activity, the context of this role becomes ambiguous. Therefore, if a note is meant to describe a property, but is instead attached to either domain or range instance, it must contain, in textual form, the path to the other entity instance.

This leaves two choices for the above example:

A)"Building house X"(E12) - P4 was carried out by - "John Smith"(E21).

"Building house X"(E12) - P3 has note: "was carried out by John Smith in the role of designer"

B)"Building house X"(E12) - P4 was carried out by - "John Smith"(E21) P3 has note: "performed Building house X in the role of designer"

Of these two options, A is the recommended solution. The instance "Building house X"(E12) is actually the context for this role, or, in other terms, more specific to the property instance than the actor. The rule, therefore, is to attach the note about a property to the domain or range instance that provides the context to describing the property, as shown in choice A) in the above example, if the property is not going to be expanded by an intermediate entity. Otherwise, one has to repeat the missing path in the note as shown in B), above, which is suboptimal.

Another solution for implementing .1 properties in RDF is documented [here](http://www.cidoc-crm.org/sites/default/files/Roles.pdf)