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The aim of this document is to define the DTD of the definitive version of PIVOT language used for the project FRESH. This DTD has been designed so that the PIVOT files associated to the analyzed mock-ups can contain the structures of the language. For a more precise description of the structures used by the PIVOT language see the documents 3.1, "Modelling of all the objects of the PIVOT universal language via UML modelling", and 3.2.1, "Identified objects converted in the PIVOT language to be used in the CAD software".

### **1.- Description of the format:**

The elements defined in the DTD have a direct correspondence with the objects of the PIVOT language, so that the XML structure of the files may contain the information extracted during the analysis of the mock-up. We can differentiate between elements that contain the geometric information and elements with the electrical characteristics.

In the first category we will include the generic elements, the elements used only in 2D, the elements used only in 3D and the elements used both in 2D and 3D. In the case of these last elements, their dimensions will be given by the number of coordinates used in their definitions. As regards the generic elements, they are a-dimensional because their only purpose is to group the geometrical nodes. The rest of the elements have their dimensions clearly specified by their names or by the object they describe.

The second group is constituted by the elements associated to the objects that describe the electrical behaviour of the mock-up components: Model, Part, Route, Wire, Slot. Model group those elements that define the electrical behaviour of a component or a mock-up, while the others contain respectively the information for defining the electrical devices, the bundle segments, the wires inside the bundles and the connections between the parts.

Apart from the previous ones, there would be another two elements that would complement the structure of the file. The first one is the node PIVOT that corresponds to the root node of the file and the second element is the Property node that hangs from the geometric or electrical elements in order to define their especial attributes.

### **3.- Future modifications:**

Version 1.2 of PIVOT allows us to describe all the geometrical elements and electrical characteristics that appear in the mock-ups easily and with a low cost of space. However, it has been found that in future versions some elements could be defined in a more intuitive way and that others could be combined together.

Firstly, we can mention the case of the circle in 2D and the sphere in 3D. The sphere in 3D and the circle in 2D are defined by the same attributes. Moreover, as it is possible to find also circumferences in 3D that can not be defined neither with the circle in 2D nor with the sphere in 3D, it is easy to think that these definitions could confuse the user. In order to solve this ambiguity it has been suggested to combine the Circle and the 3D Sphere in a single Sphere element.



Regarding the circles in 3D, in the current version of PIVOT they are defined using arcs, but this requires the division of the circumference in arcs and their conversion to the correspondent arc structures. It could be convenient to simplify it using a specific structure. This object, the circle 3D, would have as attributes the center point, the radius and the normal to the plane in which the circle is contained. The description of the circumference would be more similar to the geometrical element and the conversion from the mock-up object to the PIVOT structure would be also easier.

Finally, there are still some doubts about the convenience of the current definition or arc. It was found that this one is the definition that gives more information using less attributes, but it is felt that it still has some limitations and the number of operations for extracting the control point are more complex than what it would be desirable.

It is possible that some or all of these modifications are included in future versions of PIVOT. In that case, the correspondent modifications would be included in the DTD, so that its format suits the definition of the new version.