Another way to adapt the initial mesh to the boundary, the projection method, was proposed in [Taghavi 1994] and [Ives 1995]. The starting point is the construction of a structured grid that covers the object (fig. 15a), but in contrast to the grid based algorithm, all cells remain in place. Mesh nodes are moved onto the characteristic points of the object and then onto the object edges, so that the object boundary is fully covered by mesh edges (fig. 15b). Degenerate elements may be constructed in this step, but disappear after buffer layers have been inserted at the object boundary (fig. 15c, the mesh is then optimized by Laplacian smoothing).

Figure 15: Grid based algorithm – boundary adaption by projection technique
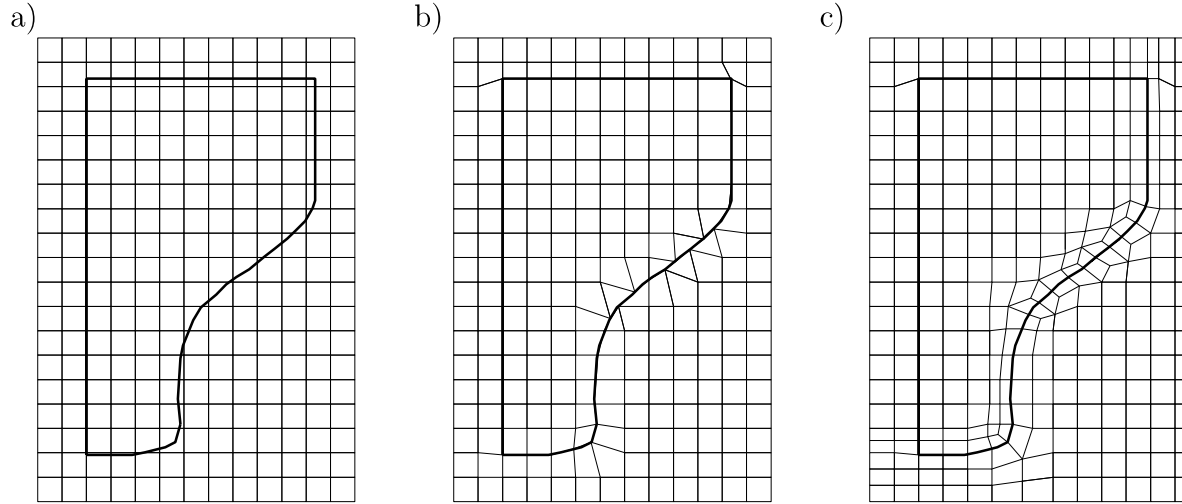
The projection method allows the meshing objects with internal faces; the resulting meshes are similar to those generated with the isomorphism techniques, although there tend to be high aspect ratio elements at smaller features of the object. In contrast to the isomorphism technique, the mesh is adapted to the object boundary before inserting the buffer layer.

Figure 16: Grid based algorithm – boundary adaption by cell splitting technique
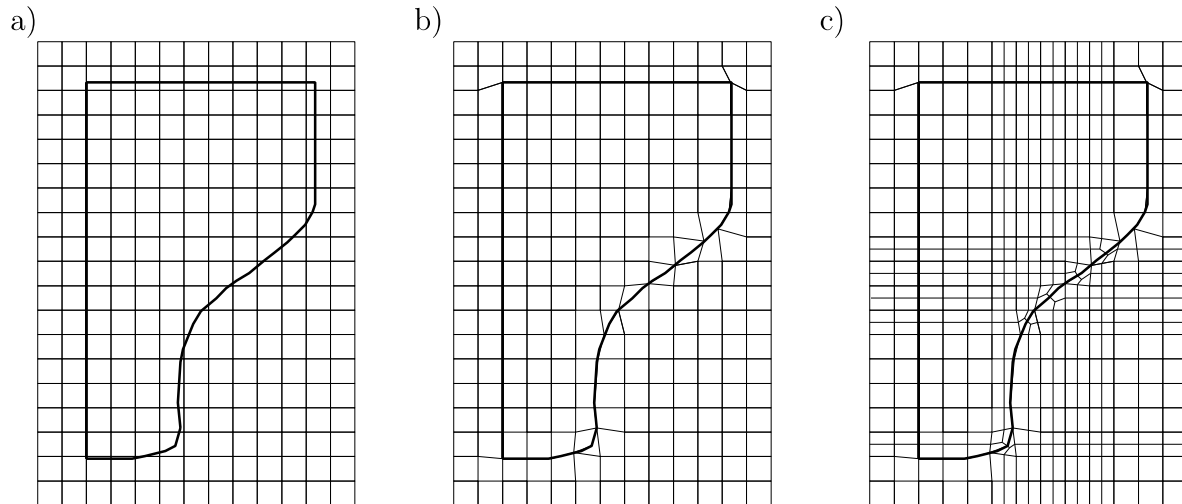
Only recently, a third method has been proposed [Dhondt 1999]. With this approach,