Discovering and developing new biocatalytic reactions and biocatalysts has been the major focus of the activities in the EC FP7 BIOTRAINS network. However, industrial implementation of these new reactions requires engineering of both the biocatalysts and the associated processes, to achieve the necessary targets for economic and sustainable feasibility of full-scale processes. The possible engineering solutions can most rapidly be identified using a series of tools and in this article we will describe some of these as well as giving a perspective on the future of this important element of process research and development.