# AN ADAPTIVE PROTOTYPING APPROACH TO QUALITY-AWARE SOFTWARE DEVELOPMENT <br> Tkachuk M.V., Pekhulia Y.I. <br> National Technical University <br> «Kharkiv Polytechnic Institute», Kharkiv 

To increase a quality of software development in different application domains the prototyping approach can be used, which supposes to answer the following question: how to form effectively a collection of already existing reusable software components taking into account some predefined system requirements (SR), especially software performance and reliability?

In order to solve this problem the adaptive macro-designing technology for component-based software solutions (CBSS) can be applied [1], and its general workflow is shown in Figure 1. This approach includes the 5 operational blocks, which perform the following tasks: the block PREPARE


Fig. 1 - Conceptual scheme
transforms the initial nonfunctional SR in a set of target properties; the block BUILD allows to construct a first system prototype using some components, design patterns and reference architectures from Repository; the block CONFIG provides the setting of variable target properties to desirable values; the block EXECUTE makes the given prototype running in order to get some unknown parameters; the block ANALYSE estimates their obtained values, and if they satisfy
the predefined target properties, then an appropriate prototype can be recognized as a final CBSS. To estimate the quality of an elaborated CBSS the integrated criteria has to be used, which is defined in the following way: $Q_{\text {total }}=\sum_{i=1}^{N} k_{i} q_{i}$, where $k_{i}$ is a weighting coefficient of an appropriate local quality attribute $\boldsymbol{q}_{i}$, where $i \in[1, N]$, and $N$ is a number of these attributes.

List of literature:

1. Tkachuk M. Towards Prototyping-based Technology for Adaptive Software Development / M. Tkachuk, A. Zemlanoy, R. Gamzayev // R. Kashek et. al. (Eds.): UNISCON 2008, LNBIP 5: Springer-Verlag Berlin Heidelberg, 2008. - pp. 508-518.
