AN ADAPTIVE PROTOTYPING APPROACH TO QUALITY-AWARE SOFTWARE DEVELOPMENT

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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* 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: $Q_{total} = \sum_{i=1}^{N} k_i q_i$, where k_i is a weighting coefficient of an appropriate local quality attribute q_i, where $i \in [1, N]$, and N is a number of these attributes.

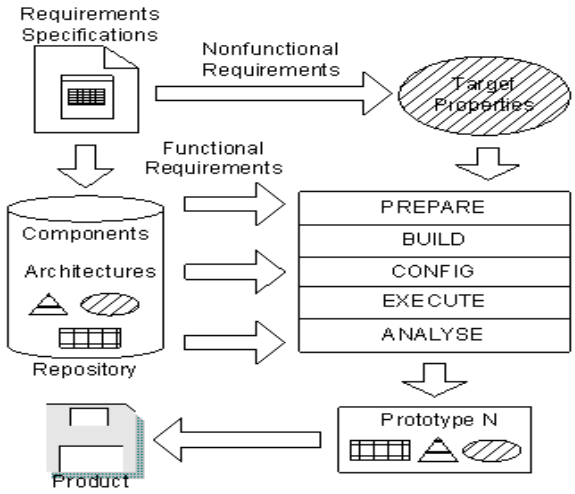

Fig. 1 – Conceptual scheme

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.