

An approach to automate the software development process: an insight from biological systems

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Software development is a tedious process requiring skills and knowledge of experts. Even with the availability of modern software tools to assist this process and technologies to reuse software components, total automation of system development is still not achieved.

Development of a living being is an automated process which uses the information stored in genes. Based on this concept, systems are modeled in terms of cells, tissues, organs and subsystems which forms a hierarchy of structures. Each structure is constructed according to user requirements using pre-stored information. The automation process is achieved using a framework, essence of which, is a triad of three base classes which are *Requirements*, *Genes* and *Designs*, which correspond to each other and exists in each level of the hierarchy. When user requirements are given as the input in a form of a text file, for each requirement, a *Requirement* class is created and its corresponding *Gene* class is selected and this Gene class generates a system component. These components are assembled to form higher level components. This process is repeated until the complete system is generated in java programming language.

We have applied this approach and successfully generated several applications of different domains. It has been shown that total automation of application development was achieved successfully for applications whose functionality was within the limits achievable with knowledge stored in existing *Genes Classes*. Reusability of the knowledge in software development, which is stored in *Gene classes*, was a main advantage.