Creativity for the software engineer: a novel organic paradigm with applications

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Creativity is the most valuable resource of the Software Engineer. But creativity is very difficult to teach and learn. In studies the author has conducted, creativity was graded as the most difficult and least motivating topic for the undergraduate SE student and teacher. And in the industry the situation is not better.

The solution proposed is to get to the roots of the problem and try more appropriate basic approach – an organic one – Organic Creativity (OC) paradigm. In very general terms OC tries to analyze the basic problems such as fear to err, writers block, difficulty to operate on a more abstract level, lack of experience and know-how and difficulty to formalize the creative process. The answer is to use a non-formal approach, though still scientific but drawing from natural sciences. When being creative the Software Engineer should act less as mathematician and more as a doctor or an agronomist. She should grow the solution using the life cycle of doctor following his patient or agronomist growing her trees.

Using her position as teacher for 17 years and head of IS program and labs, the author have very successfully tested OC at all ages: students from kindergarten to high school and especially undergraduate students of SE.

One of the OC applications implemented is a basic Object Oriented Programming course. For several years the author has tested aspects of OC to encourage their creativity (such as so called "flipped assignments"). The use of OC environment improved dramatically the attitude towards creative aspects of OOP.

After several years of design and implementation, the OC paradigm evolved into useful environment. At the heart of the environment is an Expert System enhanced with special mechanisms for learning and evolving.

In the near future such an environment will grow into commercial product and used throughout the industry.

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Fields of interest: AI applications, Educational software, Robotics, Internet of Things, STEM education.