Chapter V

Relay Race Methodology (RRM):
An Enhanced Life Cycle for Simulation System Development

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Abstract

This chapter introduces a suggested system development life cycle “relay race methodology” (RRM). The RRM is based on the philosophy of relay race, where each runner in the race must hand off the baton within a certain zone, usually marked by triangles on the track race. This chapter is comprised of nine sections. First, it shows the relationship between software and wicked problems. Then the chapter explains the motivation for analysis and design for simulation system projects. Furthermore, the chapter gives an overview of the reasons behind simulation project failures. Next, the chapter shows the sources for simulation inaccuracies and the project management issues in simulation. Subsequently, the chapter explains the proposed RRM life cycle. Consequently, the chapter presents the advantages
and disadvantages of the proposed RRM life cycle, while relating the RRM to the risk factors. Finally, the chapter compares RRM to different life cycles.

Introduction

Software is defined by DeGrace and Stahl (1990) as a wicked problem; accordingly Rittell and Webber (1973) defined wicked problems as “problems that are fully understood only after they are solved the first time.”

Moreover, according to Conklin (2003), the four defining characteristics of wicked problems are:

1. The problem is not understood until after formulation of a solution
2. Stakeholders have radically different worldviews and different frames for understanding the problem.
3. Constraints and resources to solve the problem change over time.
4. The problem is never solved.

Likewise, wicked problems, according to Horst and Webber, have ten characteristics:

1. There is no definitive formulation of a wicked problem.
2. Wicked problems have no stopping rule.
3. Solutions to wicked problems are not true-or-false but good-or-bad.
4. There is no immediate and no ultimate test of a solution to a wicked problem.
5. Every implemented solution to a wicked problem has consequences.
6. Wicked problems do not have a well-described set of potential solutions.
7. Every wicked problem is essentially unique.
8. Every wicked problem can be considered a symptom of another problem.
9. The causes of a wicked problem can be explained in numerous ways
10. The planner (designer) has no right to be wrong.

In the same token, Poppendieck (2002) proposed, in her article titled Wicked problems that “there is nothing wrong with using adaptive processes to solve wicked software development problems. In fact, it is the problem cannot be tamed, this is the only ‘good’ choice” [Poppendieck, 2003]. Indeed, the author suggested scrum methodology in her paper. Moreover, Ambler suggested to “marry agility to the Unified Process (UP)” in his article Unified and agile.
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