Classification trees and decision-analytic feedforward control: a case study from the video game industry

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Abstract The objective of this paper is to use a challenging real-world problem to illustrate how a probabilistic predictive model can provide the foundation for decision-analytic feedforward control. Commercial data mining software and sales data from a market research firm are used to create a predictive model of market success in the video game industry. A procedure is then described for transforming the classification trees into a decision-analytic model that can be solved to produce a value-maximizing game development policy. The video game example shows how the compact predictive models created by data mining algorithms can help to make decision-analytic feedforward control feasible, even for large, complex problems. However, the example also highlights the bounds placed on the practicality of the approach due to combinatorial explosions in the number of contingencies that have to be modeled. We show, for example, how the “option value” of sequels creates complexity that is effectively impossible to address using conventional decision analysis tools.

Keywords Data mining · Probability estimation trees · Decision tree analysis · Video game development · Real options

1 Introduction

Decision making in the video game development industry is known to be difficult (Barry et al. 2006; Walfisz et al. 2006). Much of the difficulty arises due to the long lag between game development decisions and market outcomes. Development firms