

# Learning from the Past: a Process Recommendation System for Video Game Projects using Postmortems Experiences\*

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## 1 EXTENDED ABSTRACT

The video-game industry is a multibillion market that faces problems in the way games are developed. One method to address these problems is to support developers with tools, such as recommendation systems, which generate recommendations to help developers perform their tasks.

This work describes a systematic approach to build a recommendation system to recommend development processes for video game projects. It uses knowledge extracted from video-game project postmortems and a model of the context of the new project. Postmortems are semi-formal articles written by video-game developers at the end of projects, which summarize the experiences, successes, and issues of the development team.

Our approach provides insights about development processes used in the video-game industry, as well as guidance to developers, to choose the most adequate process according to the contexts of their projects. It's divided in three separate phases. In the first phase, we manually extract the processes from a set of postmortems, gathered from Gamasutra (<http://www.gamasutra.com>) portal, which is a public available source. In the second phase, we create a video-game context and algorithm rules for recommendation. Finally, in the third phase, we evaluate the recommended processes by using quantitative and qualitative metrics, feedback from video-game developers, and a interview with a video game development team.

This work brings three main contributions. The first describes a database of video-game development processes, extracted from postmortems, in the form of development processes, visually expressed using Business Process Model and Notation (BPMN). The second is a video-game development model that defines and embodies the main attributes of video-game projects and that describes the context of any project. The third describes and evaluates a recommendation system for video-game development processes, which uses the database of development processes and the context to identify similar projects and suggest a set of activities in the form of a development process.

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A quantitative evaluation of the recommendation system shows a low precision and recall, indicating that more work must be done when building the recommendation system the process elements, like using a different classifier technique. The qualitative evaluation, made with the aid of video-game developers through on-line interviews, reveals that the method used to extract the process from postmortems text was well accepted. It shows also that the idea of a graphical process was considered beneficial as a support tool, especially in the beginning of the process (pre-production). Finally, the case study results exposed that a process of this type can reduce the “trial-and-error” at the beginning of a project.

The data used as well the scripts and postmortems are available on-line at <https://goo.gl/EPojvi>.

## 2 JUSTIFICATION

This work is an effort towards the non-well explored video-game development world. It highlighted the problem of choosing a development processes faced by video-game developers and, using data extracted from postmortems, it proposed a recommendation system to mitigate this problem. It create a recommendation system of development process by using data from past projects to aid video game developer. It was evaluated quantitatively and qualitatively, using interviews with real video-game developers.

We believe that presenting our journal article will foster interesting discussions on the topic of video-game development as well as empirical studies in the context of video games. We will benefit from these discussions to improve our work. ESEM is a conference about empirical software engineering and, thus, the perfect venue to discuss our empirical work. Finally, we are planning to extend this work, so new ideas are always welcome, especially from experienced researchers.

## 3 PRESENTATION

The presentation will cover all the aspects of the work, starting with the context of the video-game industry, its problems, our solution and our approach. We will present how we gathered the data, defined the video-game context, built the recommendation system, and evaluated it. We will present future works and how much of it is done already.