Capstone Projects Evolution over a Decade in a Computer Science Engineering Degree

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ABSTRACT

This study describes the capstone projects evolution over the last ten years at our university. During this period, two different degrees have existed: "Technical Engineering in Computer Science" with graduated students from 2005 through 2012, and a "Degree in Computer Science Engineering" from 2013 through 2014. Herein, the evolution of some important features of the Capstone Projects is examined: duration, grade and time devoted by the advisor. This evolution defines some phases in the first degree: beginning, stabilization, maturity, and completion. The change in the degree structure is associated with changes in the performance on projects.

Categories and Subject Descriptors

D.2.9 [**Management of Computing and Information Systems**]: Project and People Management – *Life cycle*, *management technique, systems development.*

General Terms

Management; experimentation.

Keywords

Capstone project; computer science engineering.

1. INTRODUCTION

Computer Science Engineering degrees often culminate in a capstone project, usually consisting of completing a software development project [1]. The capstone project represents a task of considerably larger scope and difficulty than any other work that students have tackled during their academic career. In order to address the project with greater possibilities of success, an advisor who guides the student and supervises his work is assigned [2, 3]. Studies in Computer Science Engineering commenced at our university in 2002 with the "Technical Engineering in Computer Science" degree and changed to the "Degree in Computer Science Engineering" in 2009. This work conducts a longitudinal study over a decade of some significant parameters of capstone projects such as project duration, grade, and time devoted by the advisor.

2. RESULTS AND DISCUSSION

In order to collect projects data, surveys corresponding to 203 projects developed in our university during the last decade were successfully gathered. The manner in which projects have been performed was studied, particularly how the following three parameters evolved: project duration, grade obtained by students, and amount of time devoted by advisors (Figure 1).
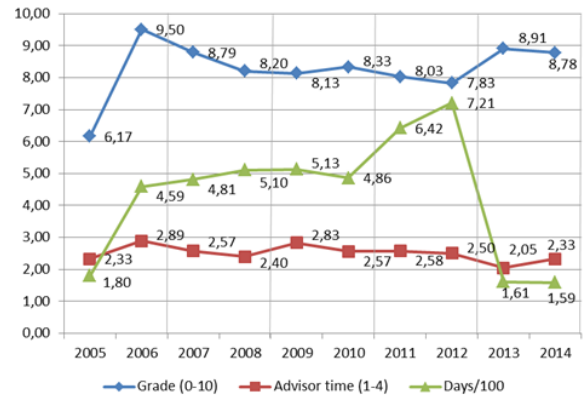
Figure 1. Grade, duration and time devoted by advisors

The evolution of projects is described through these phases below: *Beginning phase (2005-06)*. The low grade in the first year can be explained since these students prioritized finishing their degree over creating a quality project. In 2006 an abrupt rise can be observed in the three graphs. The students decided to devote more time to their projects and postpone completion to the following year obtaining better results. *Stabilization phase (2007-08)*. A sharp decline in grade and a slight increase in duration were observed. The time spent by the advisor maintained from this moment on with small variations. *Maturity phase (2009-10)*. Grade and duration stabilized, and time devoted by advisors also remained stable. *Completion phase (2011-12)*. Duration rose sharply since several projects that were long overdue had to be finalized before the end of the current degree program. Grade decreased slightly because several projects were forced to finish for the deadline, thereby compromising quality. *Initial phase of the new degree (2013-14)*. A remarkable rise in the grade and a decrease in duration can be observed, as well as a noticeable decrease in advisor time.

The new program has positively affected the performance on projects. The most important changes related to capstone projects include a previous mandatory internship and the company orientation projects in the new degree, usually in the same company where student internships were conducted. A more in-depth invest in the factors which may have influenced this improvement could be necessary, particularly the organizational changes introduced by the new program.

3. REFERENCES

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