Chapter 4
On the Improvement of Cost-Effectiveness: A Case of Regression Testing

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ABSTRACT
System maintenance is a general term required to keep a system running properly. The system could be a computer system, mechanical system, or other system. The maintenance in this sense is related to the deterioration of the system due to its usage and age. This context of maintenance does not apply to software, where the deterioration due to the usage and age don’t make sense. Conventionally, the maintenance of software is concerned with modifications related to software system. These modifications come from the user needs, error correction, improvement of performance, adapt to a changed environment, and optimization.

INTRODUCTION
Software development companies spend more time on maintenance of existing software than on development of new software, and according to earlier studies software maintenance accounts for 40-70% (Figure 1) of its total life-cycle costs.

Due to the testing process of software, the maintenance phase is undoubtedly the most costly and crucial phase in the software development life cycle. In this chapter we study in detail two well known testing techniques: Regression Test...
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Figure 1. Costs of software development stages (Bell, 2005)

Selection and Automation test, in addition to the development of a new technique to ameliorate the cost-effectiveness of the regression testing. The proposed technique is applied to an insurance system in the SNA-Soft Company, the evaluation and a comparison with other techniques is given.

NEED FOR MAINTENANCE AND COST

As software systems age, it becomes more and more difficult to satisfy user requirements and to keep them ‘up and running’ without maintenance.

Maintenance is applicable to software developed using any software life cycle model (waterfall, spiral, etc). Maintenance must be performed in order to:

- Interface with other systems
- Correct faults
- Migrate legacy software
- Implement enhancements
- Adapt programs so that different hardware, software, system features, and telecommunications facilities can be used
- Improve the design
- Retire software
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