On the Identification of the Most Efficient Implementation Sequence of MMFs and AEs

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As Information Technology (IT) develops into an important dimension of the conception and deployment of business strategies and as competition for market space increases all around us, the interest in the efficiency of the investments made in IT becomes an area of growing concern for management. This papers presents a method that allows for the identification of the most efficient implementation sequence of IT projects broken down into Minimum Marketable Feature units (MMFs) and Architectural Elements (AEs).

Keywords : Efficiency, Incremental Funding Method, IT Investment Analysis, Minimum Marketable Features, Software Engineering.

1. INTRODUCTION

The economic downturn that has been affecting the prosperity and wealth of nations worldwide has created a need for immediate reductions in business budgets, while increasing the demand for timely access to quality decision-enabling information [1]. Consistent with this view, a large variety of IT investment analysis concepts, methods, techniques and tools have been put forward in recent years [2]. Regretfully, many of these proposals have chosen to ignore that it is frequently the case that IT projects may be decomposed into smaller valuable units with high internal cohesion and low coupling [3]. As a consequence, they completely miss the fact that the order in which these units are implemented may considerably change the value of IT projects [4].

Among those who acknowledge the decomposition aspect of IT projects, some take into consideration a single performance indicator such as Return On Investment (ROI) or Net Present Value (NPV), while others suggest the use of a multi-criteria framework as a means of making their methods better suited to cope with a wider range of circumstances [5]. However, so far very little has been said about how to improve the efficiency of investments made in IT projects that have been decomposed into smaller units from a multi-criteria perspective. This paper presents a method that goes towards filling this gap.

The remainder of this paper is organized as follows. Section 2 presents a review of the principal concepts and results used in this paper. Section 3 introduces the method proposed by the authors together with an example of the use of the method. Section 4 presents the conclusions of this paper.

2. CONCEPTUAL FRAMEWORK

2.1. The Incremental Funding Method
The Incremental Funding Method (IFM), credited to Denne and Cleland-Huang [6], is a financially oriented approach to software development that advocates the break down of an IT project to be developed into smaller self-contained units that create value for business and can be deployed in shorter periods of time. According to Denne and Cleland-Huang [6]

quence selection - Table 6 presents the AHP weights for a stable scenario in which the IRR is reasonably high and obtaining capital investment is a question of concern. Table 7 shows the results of the AHP calculation indicating that sequence 642 should be used to implement the IT project under consideration.

4. CONCLUSIONS

Although financial efficiency is a matter of concern in many areas of business, previous to this paper very little had been said about the efficiency of the investment made in IT projects broken down into MMFS and AEs. This paper presents a method that helps to fill this gap. In production engineering being efficient indicates that production units are using their resources to yield products and services in the most efficient way possible, thus allowing for reduced production cost and better selling prices for consumers and clients. In this paper, IT project units are taken as production units, the dependency relations that hold true among them are acknowledged, the order in which these units can be developed is considered, the financial performance of each possible development sequencing is evaluated and the most efficient implementation sequences are identified.

However, it is important to bear in mind that efficiency is highly dependent on the measurements collected about the production units. In this paper the capital investment, return on investment, internal rate of return, self-funding point and break even point have been used to exemplify the use of the method being put forward. These particular performance indicators have been selected because they are widely used in many different circumstances in a large variety of industries. Nevertheless, other quantitative financial performance indicator such as liquidity ratios and risk indicators can be easily added to the suggested method, further increasing the number of circumstances in which it can be used successfully.

As Information Technology has, with time, permeated all business functions, making financially efficient IT investment has become a matter of concern for decision makers. Therefore, the ideas presented in this paper contribute not only to increasing the perceived business value of IT, but also to enhancing the overall financial performance of businesses in which investments in IT are being made.

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