Quantitative Approach to Software Management: the ami \(^1\) Method

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**Abstract:** The paper is describing the ami method to get started with metrication, a 12 steps supported approach. It ensures benefits for project planning and management, cost-effectiveness and match of quality objectives. The ami project is partly funded by the CEC and lead by practitioners in the European Software Industry.

The approach is adapted from the Goal-Question-Metric (GQM) method and achieves a well structured step by step guide to install metrics in any organisation. The background for each group of steps (phase) is described in the following sections and the main recommendations raised from the projects having run validation clearly pointed out.

The ami approach has already been selected by several European Companies such as ALCATEL, GEC Marconi, GEC Alsthom, EDF, Bull A.G. and ESA to act from metrics and to improve both the software process and the product quality.

### 1. INTRODUCTION

It is now common practice in business management to use quantitative methods in justifying and supporting decision-making. Considering Information Technology (IT) and Software Management, we can observe that quantitative approaches are generally absent.

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\(^1\) The ami project is sponsored by CEC DGXIII under the ESPRIT initiative. The following companies are participating to the project: GEC-Marconi Software Systems (UK), South bank polytechnic (UK), CORELIS Technologie (France), GEC Alsthom (France), Rheinisch-Westfälischer TUV (Germany), Bull-AG (Germany), ALCATEL-ELIN (Austria), Ingenieria & Tecnologia de Sistemas (Spain), O. Group (Italy)
The Japanese began to apply measurement to software production in the mid 70's. By the 80's, they had the capability of distinguishing the creative aspects of software technology from software production that uses and generates re-usable components. Measurement is now a major factor in software quality and productivity improvement in Japan, and to a growing extent, in the USA.

AM1 is a collaborative ESPRIT project involving nine European centres of excellence with many year's experience in implementing measurement for software industry. The aim of the project is to make the European software industry aware of the benefits of using measurements. Furthermore it is to provide a practical and validated approach to installing and using quantitative approaches to control and improve software process. The AM1 approach has undergone extensive industrial trials across Europe and has the support of the European Space Agency. Now, an AM1 Handbook detailing the approach and incorporating feedback from those experiences, has been presented in several countries by the end of March 1992.

2. SUMMARY OF THE AM1 METHOD

The application of goal oriented measurement in an organisation requires a structured method. Each organisation must construct its own measurement framework. Which organisation, after all, would borrow the mission statement of another?

The AM1 method implements four distinct activities - Assess, Analyse, Metricate, Improve:

Assess your project environment (with its objectives and problems) to define primary goals for measurement. Managers who initiate measurement must be involved in this activity.

Analyse the primary goals to derive sub-goals and the relevant metrics. This analysis is formalised as a goal tree with a corresponding set of questions to which these metrics are linked. The participants affected by the metrication goals (metrics promoter, project managers, quality engineers, etc.) will generally carry out this activity.

Metricate by implementing a measurement plan and process the collected primitive data into measurement data. The metrics promoter will write the measurement plan and co-ordinate its implementation.

Improve, as the participants affected by the goals start to use the measurement data and implement actions. Comparison of the measurement data with the goals and questions in the measurement plan will guide you towards achievement of your immediate project goals. When your measurements show that you have achieved a goal, you have improved enough to reassess your primary goals.