Gauging acceptance of software metrics: Comparing perspectives of managers and developers

Medha Umarji
Dept. of Information Systems
UMBC
Baltimore, MD, USA
+1 (410) 455 3956
medha1@umbc.edu

(This paper is a synopsis of a paper published by the same author at the International symposium on Empirical Software Engineering and Measurement to be held in October 2009 at Orlando, Florida).

1. Background
In the past decades, there has been considerable progress in the design and understanding of software quality, process improvement, and metrics initiatives. However, much of the potential of such initiatives might be hindered due to social and psychological factors causing resistance. Metrics initiatives are particularly prone to such resistance. The study presented in this paper is part of a larger investigation that aims to understand the social, behavioral and cultural obstacles to getting the buy-in of developers and their project managers to software metrics programs. This study was carried out in India, with the Indian software development center of a large multi-national corporation. The research questions for this study were:

1. What do project managers and their developers perceive as barriers to collecting and reporting accurate metrics data?
2. How do the perceptions of project managers differ from or agree with the perceptions (and actions) of developers?
3. Is the MAM able to recommend project-level improvements for metrics implementation?

To address these research questions, we used a mixed-methods approach in which we conducted semi-structured interviews of six project managers, asking them about problems they had with metrics implementation at ABC Corp. (name disguised). To capture the perspective of developers that these six managers oversaw, we conducted a survey based on the Metrics Acceptance Model [14] that covered all the factors related to developer resistance to software metrics in general, as well as factors specific to ABC Corp. We also applied the same survey to the original six project managers, asking them to give the responses that they believed their developers would give.

On analyzing the survey and interview data, we observed that there was a consensus between managers and developers on the ease of use of the metrics tool and factors like schedule constraints. However managers were not aware of developers’ fear of adverse consequences and low self-efficacy for performing metrics tasks. The MAM provides useful insight to project managers about developer capability and control over the metrics process.

2. Synopsis of study findings
(For details on the data collection, analysis and findings please refer to the International Symposium on Empirical Software Engineering and Measurement, ESEM 2009)

Some of the findings were:

1. The MAM-based survey brought to light developers’ fear of adverse consequences and low self-efficacy, which managers were not aware of. Managers were not able to gauge the strength of developers’ feelings about these two constructs – they over-estimated the self-efficacy and under-estimated the fear of adverse consequences.
2. For known problems in metrics programs such as schedule constraints, the MAM-based survey of PMs and developers was able to highlight that each group had its own schedule constraints of which the other group was unaware.
3. Organizational factors such as perception of organizational usefulness of metrics and reasonable business goals were viewed differently by each group. Managers thought that developers did not believe in the usefulness of metrics and hence did not use them actively. But developers’ scores on these constructs said otherwise. This “positive perceptions, negative actions” gap, revealed by the MAM, has been discussed by Hall and Fenton [4] as well. The MAM survey also uncovered a gap between managers’ and developers’ perceptions of the reasonableness of business goals.
4. Ease of use of the metrics tool was the only factor on which both groups agreed completely, and it was also discussed by project managers as one of the major foreseen problems with the metrics effort.
Therefore we can conclude that the MAM-based survey and comparative analysis was able to uncover valuable pointers to current and future impediments in the metrics program. The MAM would not only be an effective diagnostic tool at an organizational level but it would help project managers understand developers’ perceptions within the context of a small project as well.

3. CONCLUSIONS

The particular issues that highlighted differences in perspectives between managers and developers at ABC Corp. may or may not be the same issues that represent differences between these groups at other organizations. However, it is easily imaginable that these issues (e.g. self-efficacy, fear of adverse consequences) might be viewed differently by different levels in many organizations. But the more important message evident in our findings is that there are significant differences between what project managers perceive as the major obstacles to their measurement programs, and the obstacles perceived “in the trenches” at the developer level. This implies that, when designing or improving a metrics initiative, it is vital to include the developer perspective. Otherwise, important issues will be missed, thus compromising the effectiveness of the program. Our study also shows that an effective instrument for gathering this input from developers is the MAM.

Other ongoing work on this topic includes a statistical validation of the MAM based on a large collection of data from diverse organizations, to determine the level of significance of different factors in the model. At ABC Corp. we are proceeding with the larger case study (of which the study reported here is a part) by presenting our findings to the project managers and higher level management and systematically getting their feedback about insights gained by the MAM and the recommended actions they imply. The larger goal of this case study is to demonstrate not just the validity, but the usefulness in practice, of the MAM.

4. REFERENCES