Software Analytics for Manual Activities using Developer Work Elements

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Abstract: Software Engineering is a diverse and highly flexible discipline that can be practiced using a development model of developer choosing. Unfortunately, existing state-of-the-practice software engineering development models do not take human effort into consideration as there is no applicable metrics to gauge the associating manual activity. This study presents a novel discretization technique as a software analytic to estimate the manual effort expended on software development process. The proposed technique classifies three manual activity domains, namely, abstract, concrete, and unclassified. The units of classification are called Developer Work Elements (DevWE). The sequence of DevWE denotes a development analytic in three visual aids, namely, symbolic flow map, operation chart, and workload breakdown chart. These give rise to the determination of efforts expended which are measured by COSMIC Function Point. The result can be combined with those traditional software measurable activities to yield accurate total project effort estimation. Major contributions of this prospectus encompass (1) discretization DevWE analytic for manual effort estimation, (2) the visual three-chart aids support for operation trace, monitor, improve, and control, and (3) finding on almost half the effort estimation of a software project is manual activity.

Keywords: Developer Work Elements, symbolic flow map, operation chart, workload breakdown chart, COSMIC Function Point, manual activity.

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