

# Editorial Preface

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This 26th issue of the International Journal of Information Technology and the Systems Approach (IJITSA) contains four accepted papers as regular submissions. These papers were accepted after several double-blind peer review rounds executed by at least three members of the Editorial Review Board of this journal and/or asked external reviewers. Finally, the editorial decisions were jointly managed by the senior Associate Editors for the corresponding research area of the paper and the Editor-in-Chief.

The first paper is entitled “Model Based on Data Envelopment Analysis for the Measurement of Productivity in the Software Factory,” and is co-authored by Pedro Castañeda and David Mauricio both at the National University of San Marcos, Peru. In this paper, the authors reviewed 13 software productivity models reported in the literature and found a disparity and fragmentation of the used metrics. They proposed to use a Data Envelopment Analysis (DEA) technique to elaborate a holistic (including technical and economic metrics) software productivity evaluation model and identified 16 related DEA models. However, such DEA models were limited to a single Work Unit (most of them the Programming Work Unit of the Software Production function), and thus can be considered models with a limited evaluation view. Consequently, the authors elaborated a new DEA model which evaluates three Work Units (Analysis & Design, Programming, and Testing) of the Software Production function of Software Factories and their Projects taking account two inputs (Total Effort and Project Cost) and one output (Function Points). They applied their DEA model to 160 projects collected from 6 Software Factories in the Peru country. They found interesting findings which can be summarized as follows: 1) a standard evaluation software productivity DEA model which considers a wider perspective than previous ones reported in the literature; 2) evidence of the usefulness of DEA evaluation models regarding evaluation models with a single metric or based on averages and linear regression; and 3) identification of best efficient Projects not into best efficient Software Factories, which opens new improvement opportunities for best efficient Software Factories. Thus, this research contributes to the Software Engineering discipline with one of the first holistic software productivity evaluation models using objective metrics including technical and economic ones.

The second paper is entitled “Influence of the Application of Agile Practices in Software Quality Based on ISO/IEC 25010 Standards,” and is co-authored by Gloria de Lourdes Arcos-Medina at the Polytechnic Superior School of Chimborazo, Ecuador, and David Mauricio at the National University of San Marcos, Peru. In this paper, the authors elaborated a correlational model for testing the statistical support evidence of relations among a set of 4 categories of agile practices regarding 8 software quality metrics taken from the ISO/IEC 25010 standard. The four agile practices categories were Teamwork (with 7 practices), Project Management (with 4 practices), Engineering (with 4 practices) and Test (with 2 practices). The 8 software quality metrics from the ISO/IEC 25010 standard were Functional Suitability, Reliability, Usability, Performance Efficiency, Compatibility, Maintainability, Portability, and Security. Not all of the 32 possible correlations were tested because theoretically some categories of agile practices are not related to some particular software quality metrics. Thus, only 13 theoretically suggested relations were tested and data were collected through survey research on 457 public and private organizations in the Ecuador country. A valid sample of 146 subjects was collected. An Analysis of Residuals on Cross-Classified Tables and Stanine Score methods were applied to test the 13 relations. The authors found that just the agile practices categories of Engineering and Project Management were correlated to the Functionality Suitability. However, the correlation of Project Management agile practices on several non-functional quality requirements (Compatibility,

Portability, Security and Usability) was found low. This paper, thus, contributes to the discipline of Software Engineering with supportive empirical evidence on the plausible relations between agile practices and software quality metrics.

The third paper is entitled “Measuring the Effectiveness of Designing End-User Interfaces Using Design Theories,” and is co-authored by Juan Manuel Gómez Reynoso and Lizeth Itzyguery Solano Romo, both at the Autonomous University of Aguascalientes, Mexico. In this paper, the authors identified the lack of Human-Computer Interface (HCI) design training as a usual situation in the Software Engineering academic and professional community. Thus, they hypothesized that software developers, with a null or minimal previous training on HCI design taking an essential HCI design course, would elaborate software products higher HCI scored than software developers without such a training. The essential HCI design training was theoretically guided by a set of 11 user interface design principles widely cited in the literature and supported by 10 attributes of the Gestalt Theory of Perceptions. The authors conducted a controlled experiment with 59 (control group) and 56 (treatment group) senior students of a Computer Systems Engineering bachelor at their institution of affiliation. The treatment group used software previously developed with the application of the HCI design guidelines supported by the Gestalt Theory of Perceptions, and the control group a similar software but developed without design features. Both groups, however, received a short 1.5 hours training course to use each software. An evaluation questionnaire with 22 items was applied, and 11 Mann-Whitney U Tests were calculated. The authors found that 10 of the 11 alternative hypotheses were supported, and thus found empirical evidence on the benefits of knowing and applying HCI design guidelines in the development of software products. This paper, thus, contributes to the Software Engineering discipline, with empirical supportive evidence on the positive effects of training software developers on HCI design guidelines.

Finally, the fourth paper is entitled “An Analytics Architecture for Procurement” and is co-authored Sherif Barrad and Stephane Gagnon at the University of Quebec, Canada, and Raúl Valverde at Concordia University, Canada. In this paper, the authors identified the current relevance of the Procurement function in large business organizations, as well as the process complexity increment and the shortage of skilled people for managing effectively and efficiently. Thus, they investigated the potential of the emergent Analytics/Machine Learning area as mediums for elaborating managerial systems that support the modern Procurement function. The authors consequently reported the design of an Analytics/Machine Learning System Architecture composed by diverse available commercial modules, given that their main design goal was to have a Systems Architecture feasible and with seamless implementation in real settings and taking advantage of the available Analytics/Machine Learning technologies. The authors conceptually validated the potential functionalities as well as its limitations. This paper, thus, contributes to the Systems Engineering discipline with an innovative design and a business case on the need and relevance of incorporating to the current Procurement systems advanced Analytics/Machine Learning technologies, which are still massively few used in the practice.

Hence, we consider that this 26<sup>th</sup> IJITSA issue contributes –as all published past issues- to advance our scientific and practical knowledge of structures, mechanisms, and plausible solutions on relevant theoretical and real problems found in the fields of Information Technology, Software Engineering, Systems Engineering and/or Philosophy of System Sciences, from an interdisciplinary systems paradigm (Mora et al., 2008). High-quality research papers that contribute to this aim are welcome in this journal. Finally, we (Editor-in-Chief and Associate Editors of IJITSA) express our sincere gratitude to paper’s authors, reviewers, and IGI editorial staff, for their valuable participation and assistance. In particular, we recognize the invaluable academic contribution and support received by the IJITSA co-founder and Assoc. Editor for the Software Engineering area, Prof. Rory V. O’Connor, who regrettably passed away during the editorial processing of this IJITSA issue.

*EManuel Mora*  
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## REFERENCE

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