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An Algorithmic and Software Engineering Based Approach to Robust Video Game Design

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ABSTRACT

Design and development of a large video game is a challenging software engineering and project management problem. Thus, it is a non-trivial task. This paper describes the design and development of a game, entitled N-STAL, which embodies nearly every aspect of game design and implementation, including researching, crafting of assets, selection and usage of proper tools, software development, testing, and team play. Key software engineering principles are followed throughout the design, development, and validation stages. Successful execution of such design and development in an academic setting inspires team-based learning in students. It challenges them to meet project deadlines, prepares them for life-long learning, and helps them understand some of the challenges that are faced with modeling, simulation, and user interfacing.

KEYWORDS

Game Design, Game Loop, Collision Detection, Collision Avoidance, Software Development

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A New Mathematical Risk Management Model for Agile Software Development Methodologies

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ABSTRACT

This paper proposes a new mathematical model for estimating the cost of explicit Agile software development risk management with its Impact Benefit s (savings/profits). This is necessitated by the fact that despite the increase in the need for managing risks explicitly in medium-to-large scale agile software development projects presently, there are no known ways to estimate explicit risk management costs/benefits. With the proposed model, explicit risk management procedures alongside with risk management estimation techniques is made known to Stakeholders who will be able to make the right decisions on risk management costs and its impacts as well as when to utilise implicit or explicit risk management. The proposed system proves to be feasible and dependable and is evidently capable of enhancing the agile methods for use for all sizes of software projects while still maintaining the swiftness of the agile process.

KEYWORDS

Requested Risk Management Budget, Assigned Risk Management Budget, Actual Risk Management Budget, UncontrolledLoss, Needed Cost of Control

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Characterization of Open-Source Applications and Test Suites

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ABSTRACT

Software systems that meet the stakeholders needs and expectations is the ultimate objective of the software provider. Software testing is a critical phase in the software development lifecycle that is used to evaluate the software. Tests can be written by the testers or the automatic test generators in many different ways and with different goals. Yet, there is a lack of well-defined guidelines or a methodology to direct the testers to write tests

We want to understand how tests are written and why they may have been written that way. This work is a characterization study aimed at recognizing the factors that may have influenced the development of the test suite. We found that increasing the coverage of the test suites for applications with at least 500 test cases can make the test suites more costly. The correlation coeffieicent obtained was 0.543. The study also found that there is a positive correlation between the mutation score and the coverage score.

KEYWORDS

Test Development, Open-Source Application Testing, Test Coverage, Mutation Testing

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A Novel Effort Estimation Model for Software Requirement Changes During Software Development Phase

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ABSTRACT

Software Requirements Changes is a typical phenomenon in any software development project. Restricting incoming changes might cause user dissatisfaction and allowing too many changes might cause delay in project delivery. Moreover, the acceptance or rejection of the change requests become challenging for software project managers when these changes are occurred in Software Development Phase. Where in Software Development Phase software artifacts are not in consistent state such as: some of the class artifacts are Fully Developed, some are Half Developed, some are Major Developed, some are Minor Developed and some are Not Developed yet. However, software effort estimation and change impact analysis are the two most common techniques which might help software project managers in accepting or rejecting change requests during Software Development Phase. The aim of this research is to develop a new software change effort estimation model which helps software project manager in estimating the effort for software Requirement Changes during Software Development Phase. Thus, this research has analyzed the existing effort estimation models and change impact analysis techniques for Softwrae Development Phase from the literature and proposed a new software change effort estimation model by combining change impact analysis technique with effort estimation model. Later, the new proposed model has been evaluated by selecting four small size software projects as case selections in applying experimental approch. The experiment results show that the overall Mean Magnitude Relative Error value produced by the new proposed model is under 25%. Hence it is concluded that the new proposed model is applicable in estimating the amount of effort for requirement changes during SDP.

KEYWORDS

Software Change Effort Estimation, Software Requirement Changes, Function Point Analysis, Constructive Cost Model and Software Development Phase

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Project Risk Management Model Based on PRINCE2 and Scrum Frameworks

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ABSTRACT

There is a lack of formal risk management techniques in agile software development methods Scrum. The need to manage risks in agile project management is also identified by various authors. Authors conducted a survey to find out the current practices in agile project management. Furthermore authors discus the new integration framework of Scrum and PRINCE2 with focus on risk management. Enrichment of Scrum with selected practices from the heavy-weight project management methodology PRINCE2 promises better results in delivering software products especially in global development projects.

KEYWORDS

Project Management, Risk Management, PRINCE2, Scrum, Agile

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A Systematic Study Of Software Quality Models

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ABSTRACT

This paper aims to provide a basis for software quality model research, through a systematic study of papers. It identifies nearly seventy software quality research papers from journals and classifies paper as per research topic, estimation approach, study context and data set. The paper results combined with other knowledge provides support for recommendations in future software quality model research, to increase the area of search for relevant studies, carefully select the papers within a set of journals, and conduct more studies on methods used by software industry and researchers.

KEYWORDS

Software Quality, Software Quality Model, McCall model, Dromey model, FURPS model, ISO 9126 model, Techniques, Approach.

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Quality Metrics of Test Suites in Testdriven Designed Applications

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ABSTRACT

New techniques for writing and developing software have evolved in recent years. One is Test-Driven Development (TDD) in which tests are written before code. No code should be written without first having a test to execute it. Thus, in terms of code coverage, the quality of test suites written using TDD should be high.

In this work, we analyze applications written using TDD and traditional techniques. Specifically, we demonstrate the quality of the associated test suites based on two quality metrics: 1) structure-based criterion, 2) fault-based criterion. We learn that test suites with high branch test coverage will also have high mutation scores, and we especially reveal this in the case of TDD applications. We found that TestDriven Development is an effective approach that improves the quality of the test suite to cover more of the source code and also to reveal more.

KEYWORDS

Test Driven Development, Mutation Testing, Coverage Testing, TDD Processes

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E-Government Maturity Models: A Comparative Study

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ABSTRACT

Many maturity models have been used to assess or rank e-government portals. In order to assess electronic services provided to the citizens, an appropriate e-government maturity model should be selected. This paper aims at comparing 25 e-government maturity models to find the similarities and differences between them and also to identify their weaknesses and strengths. Although the maturity models present large similarities between them, our findings show that the features included in those models differ from a maturity model to another. Furthermore, while some maturity models are covering some features and introducing new ones, it seems that others are just ignoring them.

KEYWORDS

E-government, portal, maturity model, comparison, best practices, e-services, maturity stages

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A Proposed Hybrid Agile Framework Model for Mobile Applications Development

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ABSTRACT

With the increasing in mobile application systems and a high competition between companies, that led to increase in the number of mobile application projects.

Mobile software development is a group of process for creating software for mobile devices with limited resources like small screen, low-power. The development of mobile applications is a big challenging because of rapidly changing business requirements and technical constraints for mobile systems. So, developers faced the challenge of a dynamic environment and the Changing of mobile application requirements. Moreover, Mobile applications should adapt appropriate software development methods that act in response efficiently to these challenges.

However, at the moment, there is limited knowledge about the suitability of different software practices for the development of mobile applications. According to many researchers ,Agile methodologies was found to be most suitable for mobile development projects as they are short time, require flexibility, reduces waste and time to market.

Finally, in this research we are looking for a suitable process model that conforms to the requirement of mobile application, we are going to investigate agile development methods to find a way, making the development of mobile application easy and compatible with mobile device features.

KEYWORDS

Mobile Application Development process, Agile Methodologies, CMMI.

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A Review of Security Integration Technique in Agile Software Development

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ABSTRACT

Agile software development has gained a lot of popularity in the software industry due to its iterative and incremental approach as well as user involvement. Agile has also been criticized due to lack of its ability to deliver secure software. In this paper, extensive literature has been performed, in order to highlight the existing security issues in agile software development. Majority of challenges reported in literature, occurred due to lack of involvement of security expert. Improving security of a software system without damaging the real essence of Agile can achieved with the continuous involvement of security engineer throughout development lifecycle with its defined role and responsibilities.

KEYWORDS

Agile development, Agile Security Development

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