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Empirical Analysis of the Test Maturity Model Integration (TMMi)

Master's thesis (30 ECTS)

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Abstract

Testing is an essential part of the software development lifecycle for gaining trust in the quality of the delivered product. Concerns have been raised over the maturity of existing test processes and techniques, and the desire to improve has been acknowledged. Unfortunately, the decisions on how the improvement should be carried out are not straightforward.

This poses a variety of problems because even though there are test process improvement models available on the market, the guidelines on how to use them are unsatisfactory. Furthermore, insufficient information is available on how to choose the best model.

The current paper describes the literature study conducted on existing test process improvement models. As a result of this research, the potentially best model was chosen from the perspective of Playtech Estonia's Casino unit. To evaluate the choice, we conducted a single-object case study of test process assessment and improvement process based on the selected *Test Maturity Model integration* (TMMi) in the Casino unit. As part of the assessment process, a survey was carried out and staff interviews were performed to obtain an understanding of test process maturity. Based on the outcome, improvements were proposed to Casino unit's testing activities.

We provide an overview of the test process maturity concept of the framework and suggest how the described best practices could be considered in the organisation's improvement process. As a result of the assessment and improvement case study, we show the importance of understanding the reasons and objectives for test process improvement in consideration with the needs of the organisation. Identifying the best model is primarily dependent on defining organisation-side requirements for an improvement framework.

An evaluation on the performance and suitability of TMMi in a software development organisation is presented based on the case study experience, raising also the concerns of its applicability in agile environments. Improvement possibilities for TMMi are described, which have been also forwarded to the model publisher TMMi Foundation, and contribute to the potential enhancement of the framework.

Test Maturity Model integration (TMMi) mudeli praktiline uurimus
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Kokkuvõte

Testimine on tarkvaraarenduse elutsükli oluline osa, mille eesmärgiks on hinnata tarkvaratoote kvaliteeti. Kuna tarkvara roll meie igapäevaelus üha kasvab, tõusevad ka nõuded selle kvaliteedile. Sellega seonduvalt on tõstatatud küsimus olemasolevate testimisprotsesside ja –tehnikate küpsuse üle ning on sagenenud soov neid parendada. Paraku ei ole sobiva parendusmeetodi valimine lihtne.

Tarkvaraarenduse valdkonnas on esile kerkinud mitmeid testimisprotsesside parendusmudeleid, kuid nende kasutusjuhised on tihti ebapiisavad. Samuti ei ole piisavalt juhiseid sobivaima mudeli valimiseks.

Käesolevas töös kirjeldatakse olemasolevate testimisprotsesside parendusmudelite seas läbi viidud uurimust, mille tulemusena valiti potentsiaalselt parim mudel Playtech Estonia Casino üksuse seisukohast lähtuvalt. Hindamaks väljavalitud mudeli *Test Maturity Model integration* (TMMi) sobivust, viidi Casino üksuses läbi testimisprotsesside hindamisel ja parendamisel põhinev praktiline uurimus. Hindamisprotsessi raames viidi läbi küsimustikul põhinev olukorra kaardistamine ning vestlused töötajatega, eesmärgiga saada ülevaade üksuse testimisprotsesside küpsusest. Kaardistuse tulemusena identifitseeriti üksuse nõrgemad protsessialad ning tehti ettepanekud nende parendamiseks.

Töö käigus antakse ülevaade TMMi mudeli küpsusastmete struktuurist ning neis sisalduvatest protsessialadest. Samuti antakse soovitusi kuidas arvestada mudelis kirjeldatud parimaid tavasid ettevõtte parendusprotsessis. Läbiviidud praktilise uurimuse tulemusena tõdeme, et testimisprotsesside parendamise olulisim aspekt on mõista parendamise põhjusi ja eesmärke, võttes arvesse ettevõtte vajadusi. Parima mudeli valimise peamiseks eelduseks on parendusprotsessi ettevõttepoolsete nõuete määratlemine.

Läbiviidud praktilise uurimuse käigus kogetu põhjal antakse hinnang TMMi kasutamisele ja sobivusele, tuues välja kahtlused antud mudeli sobivusele väledaid arendusmeetodeid kasutavates ettevõtetes. Lisaks kirjeldatakse võimalusi TMMi mudeli parendamiseks. Kokkuvõte soovitatud parendustest on edastatud ka mudelit väljastavale organisatsioonile TMMi Foundation, mis panustab uurimisaluse mudeli edasisse arengusse.

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