The Applicability of Process-Orientation to Software Development Projects:
The Applicability of Process-Orientation to Software Development Projects

Viktorija Ponomarenko, Riga Technical University, Riga, Latvia

ABSTRACT

The progress in the digital single market (DSM) has been acknowledged as one of the 10 political priorities by the European Commission since 2015. It could contribute €415 billion per year (GDP) to the economy of the 28 EU Member States and create hundreds of thousands of new jobs. Nowadays, the ICT sector and the European Digital Agenda have declared it as one of the seven pillars of the Europe 2020 strategy. In order to speed up the development of new information technology and its commercialisation, it is necessary to increase software quality aimed at accelerating and improving technology transfer, taking into account process quality management. The aim of this article is to give an overview of a new approach to producing an additional value of the software development projects to improve the technology transfer process.

KEYWORDS


INTRODUCTION

ICT industry is rapidly developing all over the world and in Europe, and progress directly depends on a technological solution that solves the issue better by saving time, money and energy. Many software developers are struggling to find customers for their developed prototypes. In most cases, they keep a lot of prototypes in laboratories and their documents, but they don’t about their position in the market, opportunities and future direction. Usually, it is difficult to check when the software complies specification and is ready to move on the market. At the same time every day many software components are developed that could be used again and save developers time. In order to speed up the development of new information technology and its commercialization, it is necessary to increase the software quality aimed at accelerating and improving the technology transfer taking into account process quality management. The aim of this study is to give an overview to a new approach to producing an additional value of the software development projects to improve the technology transfer process.

For this purpose, were conducted an investigation of three information technology standards, six-sigma method, and process-oriented method.

The paper consists of 6 parts and conclusions. The first section is devoted to materials and methods. The second section represents process-oriented approach that is known as knowledge management approach to the development of software projects. Next parts describe this approach implementation, including the definition of software development processes, self-assessment systems development. The last section of the paper presents the results of the proposed approach and future work.

DOI: 10.4018/IJITPM.2019040101

Copyright © 2019, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
BACKGROUND

This paper is devoted to help the software developers set the best operation plan and make a right decision in their projects. It is applied to:

- Checking, analysing and improving existing projects;
- Set the improvement plan;
- Increase the quality of the projects.

Within the framework of this article, authors offer an evaluation of software quality with knowledge management, which combines knowledge about software development processes, asset protection, and marketing activities with the aim of creating an added value for research organization. For knowledge management is applied process-orientation method (Yin & Xiong, 2016). For process assessment and decision making was used information technology process assessment standard ISO/IEC 33020:2015 (ISO/IEC, 2015) and Capability Maturity Model (Mark et al., 1993) combined with six-sigma method (Montgomery & Woodall, 2008). For defining software development processes IEEE information technology standard 1517 – 2010 (IEEE, 2010) was chosen.

PROCESS-ORIENTED APPROACH TO DEVELOPMENT OF SOFTWARE PROJECTS

Process orientation is known as knowledge management approach where knowledge is considered as a set of process to help managers to set the best operation plan and make right decisions. It is possible to give out six phases of process management:

**Step 1:** Processes have to be clearly set and documented.
**Step 2:** Process’s performance has to be checked by using quantifiable metrics.
**Step 3:** Process performance has to be analysed with the help of graphical images, diagrams, causal relationship analysis or others.
**Step 4:** Process’s stability has to be analysed and new aims and tasks have to be set, if necessary.
**Step 5:** Process’s improvements have to be planned in coordination with new aims and tasks.
**Step 6:** The set process’s improvements have to be implemented for fulfilling the aim.

Process approach will help to justify strong and weak sides of the software development project, determine the causes for the problems and define necessary changes. The advantages and disadvantages of this approach are listed below (Table 1).

The process-oriented approach allows developing an integrated system for documenting, analyzing and improving knowledge activities.

DEFINITION OF SOFTWARE DEVELOPMENT PROCESSES

Sustainable software development is initiated with actual or potential end-users needs definition, including requirements analysis, architectural design and creating documentation, and ends with the satisfaction of all identified needs. A part of the processes for software commercialization can be covered by the end-user or some mediator/marketing department. However, the software developer must understand and evaluate the full lifecycle of software, including software protection and commercialization issues.

For defining software development processes was chosen IEEE information technology standard 1517™–2010 (IEEE Standard for Information Technology, 2010) and Inventor’s Technology Transfer
Information Technology and Corporate Profitability: A Focus on Operating Efficiency
[www.igi-global.com/article/information-technology-corporate-profitability/1233?camid=4v1a](www.igi-global.com/article/information-technology-corporate-profitability/1233?camid=4v1a)

Credit Card Users' Data Mining
[www.igi-global.com/chapter/credit-card-users-data-mining/14305?camid=4v1a](www.igi-global.com/chapter/credit-card-users-data-mining/14305?camid=4v1a)

The Didactical Potential of Robotics for Education with Digital Media
[www.igi-global.com/chapter/didactical-potential-robotics-education-digital/22764?camid=4v1a](www.igi-global.com/chapter/didactical-potential-robotics-education-digital/22764?camid=4v1a)