The 18th INTERNATIONAL SCIENTIFIC CONFERENCE
INFORMATION TECHNOLOGIES AND MANAGEMENT 2020
April 23-24, 2020, ISMA, Riga, Latvia

Philippov D, Linde I

Accelerate statistical process improvement methods using process mining

Dmitry Philippov*, Ivars Linde

ISMA University of Applied Sciences, Riga, Latvia

*Corresponding author's e-mail: escamillo@mail.ru

Abstract

Process Mining is a next generation technique to collect, analyze and visualize process statistical data for further continuous process improvement. Process Mining simplifies, fastens and overcomes some of the barriers of the Six Sigma DMAIC cycle in improvement projects execution.

Keywords: Process Mining, Six Sigma, DMAIC, Business Process Improvement, Continuous Improvement.

1 Introduction

What can be measured, can be improved. Call for action aimed on for Business Process Improvement (BPI) [1] cannot be done before the reality of measurement is met. How can organizations effectively measure the "as-is" process and how can they define, execute changes within the process and assess the impact of these changes on the business? This is where process mining solves the issue and makes Business Process Improvement effective.

The most common methodologies for Business Process Improvement are TQM (Total Quality Management, popular in 70's, and Six Sigma, established as an approach #1 by TOP Fortune companies to achieve their business goals by removing the causes and defects in a process, with the goal of error-free performance. The core difference of Six Sigma is strong infrastructure of champions and sponsors that requires management involvement, while simultaneously creating a true team-level culture of continuous improvement. Six Sigma takes the DMAIC 5 step approach [2].

High speed of business development and IT-development requires for new algorithms for data collection, analyze and decision making. Nowadays most information systems implemented in business are able to log enormous amounts of events that could be a subject for exploration for both Six Sigma and process mining.

2 Decision

The mining process is an automated algorithm that allows you to determine the BPI phase "as is" to identify waste, bottlenecks, anomalies, and opportunities in an existing workflow or process. The data mining process relies on verifiable data in IT systems and replaces the manual display of processes, which depends on human errors and time loss.

It is extremely important to understand the data that is analyzed during the analysis, namely the event logs [3]. Unlike conventional data mining, process mining is always based on a specific form of data, which is basically a tracking log that records transactions in real time. The data mining process creates a statistical way of connecting real information recorded in the event logs of the information system to data analysis for performance management. As shown in Figure 1 [4], once transactions in the real world

are recorded in the event log of the software system, three types of process analysis can be practiced.
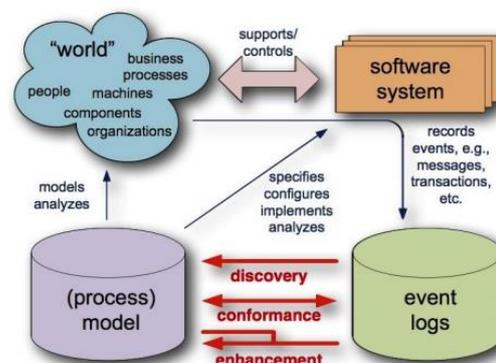

FIGURE 1 Production process structure

A critical step at an early stage is a deep understanding of how this process actually works in real life. Guides and documentation may take into account "should be", but the mining process is connected with "as is". It is here, at this stage of understanding, that the mining process is first applied.

The production process actually provides the basis for streaming processes and tracking inefficiencies and losses. In other words, the mining process provides raw materials for analysis in the Six Sigma project. It may seem that the mining process does not play a significant role at the analysis stage. However, compared to conventional Six Sigma methods, the raw materials are much more refined and prepared for continuous analysis.

A key success factor is the development of a detailed control plan that documents all the changes that are introduced into the process and locates these changes in the process stream.

3 Conclusion

The application of process mining according to DMAIC framework in a structured and step-by-step way to improve business processes. DMAIC is a data-driven improvement cycle used for improving, optimizing and stabilizing business processes and designs. Whether or not Process Mining is applied, defining a clear and precise objective and scope is an important first step [5]. Taking advantage of

The 18th INTERNATIONAL SCIENTIFIC CONFERENCE
INFORMATION TECHNOLOGIES AND MANAGEMENT 2020
April 23-24, 2020, ISMA, Riga, Latvia

Philippov D, Linde I

existing data extracted from the information systems is one of the advantages when applying Process Mining. This speeds up the process of measurement significant, resulting in less discussion about the quality of the collected data. However certain preconditions must be satisfied in order to take advantage of the data from the information systems.

References

[1] Maha Syed Ibrahim, Aamer Hanif, Faheem Qaisar Jamal, Ali Ahsan 2019 *Towards successful business process improvement – An extension of change acceleration process model* Published: November 27, 2019 **E-source:** https://doi.org/10.1371/journal.pone.0225669

[2] ISO, ISO 13053-1:2011 *Quantitative methods in process improvement - Six Sigma - Part 1: DMAIC methodology*, Standard, 2011

[3] *The Integration of Process Mining and Lean Six Sigma, With a case study on the improvement of an accounting reporting process*, Wei Zhong, Tilburg, p. 23

[4] Accelerate DMAIC using Process Mining, Frank van Geffen, Rudi Niks, Rabobank, The Netherlands and O&I Management Consultants, *The Netherlands, CEUR Workshops Proceedings* **1052** ISSN 1613-0073