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ERP Post Implementation Review with Process Mining: A Case of Procurement Process

Mahendrawathi ER*, Shania Olivia Zayin, Firman Jati Pamungkas

Information Systems Department, Faculty of Information Technology, Institut Teknologi Sepuluh Nopember, Surabaya, 60111

Abstract

This paper promotes the use of process mining and root-cause analysis from BPM field to conduct post implementation review of ERP implementation at business process level. First, literature on ERP post implementation, measure of success, ERP lifecycle and process mining are reviewed. Then, a case study on a agricultural chemicals company that recently implemented an ERP systems is conducted. The focus of the case study is procurement process in the company. Interviews are conducted with procurement staffs in the company to obtain the standard procurement process. Then, data is extracted and structured into event logs. The event log is processed with Disco to discover the process model. Analysis was done to discover the normal and unusual paths in procurement process. ERP implementation is expected to increase efficiency of the procurement operation in terms of cycle time reduction. The process mining results show that some of the activities are very uncontrolled i.e. sometimes it can be done in a short time but in other cases it took a long time. The activity can be done quickly because the procedure is bypassed. The bottlenecks occur due to technical issues (error in the systems), data migration issues (the introduction of new material numbering and categories) and cultural issues (high dependency of hard copy approval). These issues need to be resolved so that the company can realize the operational efficiency benefit and eventually long-term strategic benefit of ERP implementation.

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Keywords: Post Implementation review; Process Mining; Procurement; SAP Materials Management

* Corresponding author. Tel.: +0-000-000-0000 ; fax: +0-000-000-0000 .
E-mail address: mahendra_w@is.its.ac.id

1. Background

In today's business environment, Enterprise Resource Planning (ERP) is one of the most common IT investment taken by companies. ERP is an integrated package software with a single database and different modules to serve the need for various functions in an organization [1]. ERP is expected to provide competitive edge as it promises integration of business processes and access to integrated data across the entire enterprise [2]. While benefits of ERP implementation are well documented in the literature, there also many challenges and impediments in implementing ERP that lead to relatively high failure rate of ERP implementation projects. Implementation of ERP need to be managed as a project that go through different phases and has a specific beginning and end date [3]. There are a lot of studies that focus on ERP adoption and implementation, while post implementation review received less attention [4]. Most recently, several studies have been done that focus on ERP post implementation review.

ERP post implementation studies focus heavily on measuring the success in average and high-level metrics such as Return on Investment or profit. Gattiker and Goodhue [4] argue that this result does not happen automatically and there must be pathway through which ERP causes higher profit. They point out further that key intermediate benefits for ERP might include higher quality data for decision making, efficiency gains in business processes, and better coordination among different units. There are not many reported studies that look at the impact of ERP implementation at the intermediate level, particularly, business process level. Furthermore, most of the studies require researchers to collect additional data for the measurement which can be time consuming. The fact that the entire business process is automated and the data of how users conduct the activities are stored in the ERP database, provides a rich opportunity to evaluate how the processes are enacted with ERP system. Process mining is a technique that develop a model based on data stored in information/enterprise systems database.

This paper proposes the use of Process Mining to conduct ERP post-implementation review at a business process level. In order to achieve this goal, a case study of agricultural chemicals company that recently implement ERP systems is conducted. The focus of the analysis is on procurement process that is based on user's request and supported with SAP Material Management module. This include several activities: purchase requisitions creation and approval, purchase order creation, quality inspection and good receipt. Thus, the novelty of this paper is that it provides an alternative approach to conduct post-implementation review at the business process level based on data recorded in the company's ERP database that will provide a better view on the actual process.

2. ERP post implementation review

An ERP project lifecycle typically consists of three phases: ERP adoption, implementation and post-implementation [5]. Motiwalla & Thompson [6] breakdowns the traditional ERP implementation project into several stages: scope and commitment, analysis and design, acquisition and development, implementation and operation. One of the main concern in ERP implementation is whether the ERP systems fit the company's business process. A business process is a set of inter-related activities conducted by a company to achieve its goals. ERP provides a so called best practice business processes, which may not fit the way the company currently run or expected to run their business [7]. Therefore, one of the main decision in ERP implementation is whether the company change their business process to align with ERP software or to customize the software to meet the company's business processes.

Post implementation normally starts after operationalization of the ERP and continues until the previous legacy systems is changed into the new [8]. Typically, when the post implementation is successful then the entire ERP implementation is considered a success. There are a lot of studies that focus on ERP adoption and implementation, while post implementation review received less attention [4]. Many research assess the ERP implementation success based on whether the project is done within the specified time and budget, but neglect the ultimate goals of ERP implementation i.e. creating business value and improve business performance. More recently, researchers shift the focus from ERP adoption and implementation to post implementation phase [9,10,11]. One of the main motivation for the studies are the notion that successful ERP implementation is not a guarantee for sustainable usage and realization of benefits expected from the implementation. The expected benefits of ERP system cannot be fully or comprehensively realized as it cannot assimilate to various business process during post implementation phase [9,12].

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