Implementation of CRISP Methodology for ERP Systems

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Abstract— ERP systems contain huge amounts of data related to the actual execution of business processes. These systems have a particular way of recording activities which results in an unclear display of business processes in event logs. Several works have been conducted on ERP systems, most of them focusing on the development of new algorithms for the automatic discovery of business processes. We focused on addressing issues like, how can organizations with ERP systems apply process mining for analyzing their business processes in order to improve them. The data handling aspect of ERP systems contrasts with those of BPMS or workflow based systems, whose systematical storage of events facilitates the application of process mining techniques. CRISP-DM has emerged as the de facto standard for developing data mining and knowledge discovery projects. Successful data mining requires three families of analytical capabilities namely reporting, classification and forecasting. A data miner uses more than one analytical method to get the best results. The objective of this paper is to improve the usability and understandability of process mining techniques, by implementing CRISP-DM methodology for their application in ERP contexts, detailed in terms of specific implementation tools and step by step coordination. Our study confirms that data discovery from ERP system improves strategic and operational decision making.

Keywords- ERP; CRISP-DM; BPMS; SAP; Clustering; Classification; Regression; Association Analysis; APD

I. INTRODUCTION

Data mining can be used to automatically determine significant patterns and hidden associations from large amounts of data. Data mining provides insights and correlations that had formerly gone unrecognized or been ignored because it had not been considered possible to analyze them [1]. Generally speaking, Functional requirements and Business rules cannot be ported from one ERP implementation to another because local operations have highly specific [2] and customized procedures for operating that equipment [3] [4]. ERP systems implement highly customized solutions to meet specific business requirements of enterprises. Since each enterprise has different data mining requirements, it is not possible to deliver fixed models for producing prediction results. Data mining professionals are challenged with developing different models to meet such business requirements which help in decision making. Data extracted from ERP system can be mined to answer business questions like – differential product pricing to match customer profile, customer churn, cross selling potential of new products, cash flow analysis etc. ERP can play an essential role in Driving accurate and fast decisions (product profitability, procurement spend) with consistently defined data [3]. The benefits from ERP implementation can be measured both in qualitative & quantitative terms like- efficient business processes, enhanced customer service, reduced costs, improved productivity, accelerated transaction time, workflow management and reduction in the number of credit management errors. [4]. In this paper we have discussed how CRSIP-Data Mining methodology can be implemented on ERP system data of a large manufacturing enterprise, where SAP is the ERP solution provider [5]. The rest of paper is organized as follows – Part II discusses Data in ERP Systems, Part III outlines CRISP-DM methodology, Part IV discusses Implementation of CRISP-DM, Part V specifies Implementation steps, Part VI discusses Results and finally Part VII provides Conclusions on paper.

II. DATA IN ERP SYSTEMS

ERP systems provide an increased level of integration to support core business processes and is an amalgamation of three most important components - Business Management Practices, Information Technology and Specific Business Objectives. Till recent past operational and transactional needs and not information were the focus of most ERP implementations. At the core of ERP is a well managed centralized data repository which