The Impact of Information Systems on Management Performance in the Pharmaceutical Industry

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ABSTRACT

There are many aspects that should be considered while implementing ISs in pharmaceutical companies. This is due to the various regulations and standards that the governmental authorities impose on these companies. In addition, any audit from US Food and Drug Administration (FDA) or other authorities will require computer system validation to be performed for the implemented ISs to ensure that all areas that affect the drugs lifecycle are following the required standards, and that each single process in this lifecycle is validated. Unfortunately, many pharmaceutical companies didn't recognize yet the importance of ISs to their businesses. The research presented in this paper examines the value of using an information system (IS) in pharmaceutical environment and how it can be a key component of improving the operational and process effectiveness by supporting the strategic decisions and enabling the decision-makers to take their decisions in short time. Lack of information in pharmaceutical companies is one of the reasons why these companies will not be able to compete in this competitive market because the delays in taking decisions, product lifecycle, and supply chain. Pharmaceutical companies required to follow various regulations and standards, and ISs are the tools that can be mapped to these standards and control the business operations without any obstacles. The authors conducted a comprehensive study to investigate the role of ISs in the pharmaceutical industry through a review of existing literatures relevant to the research subject and through a questionnaire survey with 54 participants working in the pharmaceutical industry in different countries in the Middle East. The survey aimed to understand the present status of ISs in pharmaceutical companies and the impact of ISs on management performance, operation improvement, end-users productivity, and compliance with the regulations and standards of the pharmaceutical industry in their companies. Moreover, the survey also aimed to identify the catalysts behind successful implementation of ISs.

Keywords: *Information Systems, Operations Management, Performance Measurement, Pharmaceutical Industry*

DOI: 10.4018/JCIT.2015070106

1. INTRODUCTION

In the Middle East, pharmaceutical companies are facing a heavy pressure from the regulatory authorities that are concerned with monitoring the medicines markets, by applying very tough regulations and standards to ensure the products quality. These regulations can be applied and mapped through implementing robust information systems (ISs). The advances in science caused major leaps forward to modern medicine from the nineteenth century onwards, and the evolution of scientific knowledge has pushed forward the growth of the modern pharmaceutical industries (Gribben, 2004). According to Abdulzaher (2013) "*The Gulf countries are expected to invest USD 12 billion in the pharmaceutical industry by 2020 and Saudi has the largest market for medication in the region with USD 5.1 billion in 2012*". Alpen Capital's 2014 report (Alpen Capital, 2014) estimated that *the size of the Gulf Cooperation Council (GCC) healthcare market would become US$ 69.4 billion by 2018 from US$ 39.4 billion in 2013 with the 12% annual growth*. Pharmaceutical companies are driven by many of the rigorous regulations and standards that are controlling and monitoring the drug development and production life-cycle. As shown in Figure 1 (Laínez et al., 2012), the finished product of the drug production starts from product development processes (which can take years until reaching the final formula), stability studies (which take 2-3 years in incubators in different temperature and humidity atmosphere), product registration (which will take also almost one year of the file submission), and then will start the manufacturing processes starting with material requirement planning, production and capacity planning, right down to delivering the finished product to the end user in the market (Laínez et al., 2012).

All of the above aspects raise the need of having the right tools that ensures compliance with regulations. The information system (IS) is perfect in serving this purpose as it has the ability for managing the huge data records, and make it accessible, and easily analyzed. Therefore the advantages it offers include; (i) Comprehensive enhancement of the organization business processes, (ii) adaptation of all the desired standards and best practices to the environment and (iii) such an integrated and compliant IS would positively support strategic decision making.

The scope of this research work includes (i) identifying the standards and regulations that regulate and control the pharmaceutical industry in the Middle East, (ii) identifying the risks and problems that pharmaceutical companies are facing due to the lack of information, (iii) identifying the main factors of IS implementation success in the pharmaceutical industry, and

Figure 1. Product life cycle (Laínez et al., 2012)