Empowering CRM Through Business Intelligence Applications: 
A Study in the Telecommunications Sector

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ABSTRACT

The application of business intelligence (BI) techniques for knowledge discovery and decision support empowers organizations in different functions. This article examines the impacts of BI on customer relationship management (CRM) functions (marketing, sales and customer services) in the telecommunications sector. The literature found that BI application in CRM in a telecommunications context is limited but necessary due to the high rate of competition between service providers and the massive data generated by subscribers. This study surveyed employees’ perspectives from telecommunications companies in Oman, and results demonstrated mixed impacts. First, the results showed that implementing BI in marketing has a positive impact on business processes values, customer values, but a negative impact on employees’ values. Second, implementing BI in sales has a positive impact on financial values and employees’ values, but a negative impact on business processes values, and customers’ values. Finally, implementing BI in customer service has a positive impact on employees’ values. The study provides valuable guidelines for practitioners in the area of CRM, BI, and telecommunications to help understand why to invest in BI in specific CRM functions.

KEYWORDS

BI Applications, Business Intelligence, CRM, Knowledge Discovery

INTRODUCTION

Customer relationship management (CRM) has been defined in different ways but focuses on two main aspects: customer relationships and corporate profitability (Iacob, 2009; Khan et al., 2012). Khan et al. (2012) also defined CRM as a set of guidelines, procedures, processes, and strategies that enable companies to understand how customers interact with them and to maintain comprehensive customer information. CRM is part of management processes to achieve and sustain customer loyalty (Iacob, 2009).

Business intelligence (BI) is a set of tools, techniques, and processes that assist an organization in utilizing raw data in different forms to acquire knowledge and consequently make better fact-based decisions (Jennex & Bartczak, 2013). BI makes the best use of data, whether it is structured (e.g. relational database) or unstructured (e.g. web logs). In its raw state, data does not identify any particularly useful facts unless data has been processed in a proper way. Data can come from different business processes such as sales, customer usage, or logistics. The granularity of facts that BI stores is important to summarize data for strategic views, while drilling down to a single fact about specific customers for operational actions (Dobrev & Hart, 2015). Furthermore, storage capabilities

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available today make detailed, massive data easier to maintain, process, and retrieve. Organizations can create and discover knowledge through capturing new knowledge from specific explicit sources (Nonaka, 1994). BI techniques improve the efficiency and effectiveness of knowledge creation through combination. “BI systems combine data gathering, data storage and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers” (Jennex and Bartczak, 2013, pg.25). Both business intelligence and knowledge management focus on strategic intelligence, which adds value to organizations (Daliker, 2011). Therefore, it is critical to understand BI’s uses and how it can help organizations with answering business questions and decision support. BI has been used differently under various forms. Some concepts that resemble or overlap with BI are worth shedding light on, such as data warehouse (DWH), online analytical processing (OLAP), and data mining (DM) (Munyoroku, 2016). Advanced analytics and algorithms are critical today to harness valuable knowledge and business value from big data and the internet of things (Jennex, 2017). System use, including knowledge management tools (Jennex, 2008; Jennex & Olfman, 2006; Al-Busaidi, 2010), is a critical indicator of an information system’s (IS) success (DeLone & McLean, 2003).

BI is vital for telecommunications in gaining competitive advantages over competitors (Masoud & Ahmed, 2017). Also, BI has an important role in CRM in telecommunications, especially in understanding customers. Literature reviews underscore the importance of investigating the benefits of BI application in CRM. Moro, Cortez, and Rita (2015) conducted a literature review for articles from 2002 to 2013 in BI and highlighted research gaps, as CRM has not been one of the top-investigated areas for BI applications. Additionally, Khan et al. (2012) recommended further investigation of CRM and data warehouse in industries such as telecommunications. More recently, Trieu's (2017) literature review of the last 15 years articles highlighted a lack in finding a systematic framework an organization can use to highlight the values of BI.

Telecommunications is a dynamic sector where customers go through cycles of terminating subscriptions concurrent with new subscriptions coming in (Gersil, 2016). Such waves of customers coming and leaving make companies in the sector look for new methods to retain customers. Also, telecommunications companies face the challenge of managing the massive data generated from their system, which might increase in coming years (Masoud & Ahmed, 2017). In fact, telecommunications has data which exceeds most other industries in the market (Singh & Singh, 2016). Therefore, the telecommunications sector requires methods and tools to compete in the sector and understand customers’ behavior from this massive data using BI (Singh & Singh, 2016). The use of BI (Khan et al., 2012; Wang et al., 2013) and CRM (Khan et al., 2012; Toyese, 2014) can bring relevance to telecommunications companies to achieve that success.

Consequently, this study focuses on the application of BI in CRM in telecommunications companies in Oman. The evolution of the telecommunications sector in Oman has noted several changes in the last few decades. In 1980, telecommunications companies were limited to a single company, Omantel (Omantel, 2016). However, due to Sultanate of Oman’s in expanding the sector and the royal decree to establish a regulatory authority, many developments occurred, such as new operator and the establishment of the Telecommunications Regulatory Authority (TRA) (TRA, 2015, 2016). The competition in such sectors is extremely high and every service provider tries to achieve better market penetration while increasing subscribers and revenue.

**BACKGROUND**

**Customer Relationship Management Functions**

CRM has been important for functions such as marketing, sales, and customer service. Furthermore, CRM allows sales functions to be more productive, as it provides important information, such as products purchased, or agents’ sales to sales force teams when needed. CRM is a cross-enterprise
Embedding Learning within the Processes of Organizations
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