Improving Data Quality in Intelligent eCRM Applications

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INTRODUCTION

Many organizations are implementing electronic Customer Relationship Management systems in an effort to secure and maintain competitive advantage. Developing and enhancing long-term relationships with customers requires using quality data about the customers. Unfortunately, many e-CRM systems have failed to achieve their objective because of the issues associated with data integrity (Chen & Ling, 2008). The integrity of the data used to make decisions regarding customers in an organization affects the quality of the decisions made.

Protecting data integrity is challenging particularly in big organizations. The challenges associated with data integrity are increased by the complexity of the current business environment. Furthermore, marketing strategies and programs usually change rapidly in organizations (Fan, W. et-al, 2011). Therefore, to get the most out of relationship marketing, the customer data has to conform to the standards in a given industry. In addition, the data should be time stamped to make its validity clear. In addition, the data should be complete and accurate by having all the required values correctly entered. Finally, it is important for the customer data to be consistent (Chen & Ling, 2008). This means that the data values should be aligned across all systems in an organization.

BACKGROUND

Various studies have been done before by a number of scholars as far as the quality and accuracy of data in e-CRM systems are concerned. Research on optimising the value of e-CRM application in E-commerce aims at determining the responsive prospect of customers to E-commerce applications (Ahmed, Maati & Al Mohajir, 2015a). The study revealed that customers often become frustrated if the e-CRM system is redundant and incapable of meeting their needs and expectations. A revelation from the study is that quality of data goes far deeper to include ergonomic relationships (Ahmed, Maati & Al Mohajir, 2015a, pg. 150). As such, any design or approach to improve data quality must measure and ascertain that the implementation of an e-CRM system meets the ergonomic conditions. With the study aiming to determine whether potential customers can respond to the e-CRM application, the researchers established that culmination of the application should deal with all customer-related issues. Such issues include customer services facilitation, sales and marketing, and field support (Ahmed, Maati & Al Mohajir, 2015a, pg. 152).

In addition to data quality issues, companies embracing e-CRM systems face difficulties in developing effective technological infrastructure considering the limited time and resources (Ahmed, Maati & Al Mohajir, 2014, pg. 214). A

recent study revealed that 66 percent of loaded orders are discarded before checkout, and only 5 percent of customers who visit organisations' online stores become customers (Ahmed, Maati & Al Mohajir, 2014, pg. 214). The aim of the research was to show that E-CRM is not limited to internet data but includes other devices such as phones, set-top boxes, pagers and so forth.

In another research by same authors, Ahmed, Maati, and Al Mohajir on how to improve the E-CRM intelligence by using CRM data analytic tools such as OLAP, data mining and web analytics, it was established that CRM analytics tools not only contribute to exceptionally productive customer relationship as regards sales and service delivery but in the development of adverts, planning, and the analysis of customer data as well (Ahmed, Maati & Al Mohajir, 2015b, pg. 7). As such, it is evident that real experience for an online client is dependent on an intelligent, concise, and convenient application.

In another study, authors targeted to a larger extent the problems resulting from formatting errors, data inconsistencies and lexical errors. A good example is the token based and attribute selection algorithms (Z. Yuhang, 2010). The algorithms allow for eliminating duplicate records data in databases. The algorithms' implementation is in such a way that users pick on the source and the preferred mode of repair. This functionality is realized courtesy of the application of distance function on the attributes that are unclean. In these algorithms, the repair time and progress is visible (Z. Yuhang, 2010). Yuhang suggested a new technique for cleaning using the frequency of words appearance. In clustering texts, C- clustering algorithms were used. It was a very effective technique in the reducing of tendencies of doing a mistake whenever a word that is rare is to be filtered (Nguyen & Mutum, 2012). With the help of the open source tool called Febrl, new algorithms and techniques for record linkage can be developed. It

possess the ability to allow for varied formats of files and has a number of methods for encoding.

Problem Statement

CRM systems benefits organisations in a number of ways. The systems enhance coordination of internal processes and organizations' responsiveness to customers' needs. Data integrity is however an issue of major concern as far as e-CRM systems are concerned. In the current business environment, data is available from a lot of sources (Chen & Ling, 2008), in large quantities and huge complexities. According to a recent research by Bluewolf Consulting, data quality is a major issue of concern in e-CRM systems. According to the survey conducted by Bluewolf Consulting, 38 percent of the respondents were not confident in the accuracy of their instance's data.

A different research revealed that data quality problems cost an organization around $ 100 per dirty record. The $ 100 per dirty record includes costs such as the cost of printing and mailing to bad address, the losing disgruntled customer, sales conflict over the same lead and incorrect marketing segmentation and personalization. It is also important to point out that bad data is one of the three reasons why CRM projects fail. This is because bad data results in misleading, incomplete and confusing information. Data quality issues are therefore important when implementing e-CRM systems and can lead to limited acceptance or outright failure of the systems if measures are not put in place to enhance data integrity (Vitt, 2014). In this paper, proposed framework and algorithm for enhancing data quality in e-CRM systems is presented.

Literature Review

The goal of integrating business intelligence systems with E-CRM tools and techniques is very valuable to organizations today. It is due to the

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