Enhancement of Student Experience Management in Higher Education by Sentiment Analysis and Text Mining

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ABSTRACT

The objective of this case study is to illustrate how text mining of open-ended responses and sentimental expressions (positive or negative) from student survey could yield valuable information for improving student experience management (SEM). The concept of student SEM was borrowed from the notion of customer experience management (CEM), which aims for ongoing improvement of customer relations through understanding of the customer’s point of view. With the advance of text mining technology, which is based upon artificial intelligence and machine learning, textual data that were previously underutilized are found to be valuable in CEM. To illustrate how text mining can be applied to SEM, the authors discuss an example from a campus-wide survey conducted at Arizona State University. The purpose of this survey was to better understand student experiences with instructional technology in order for administrators to make data-driven decisions on its implementation. Rather than imposing the researchers’ preconceived suppositions on the students by using force-option survey items, researchers on this project chose to use open-ended questions in order to elicit a free emergence of themes from the students. The most valuable lesson learned from this study is that students perceive an ideal environment as a web of mutually supporting systems. Specifically, online access should be augmented by use of laptops and availability of course materials, whereas virtual classes should be balanced by human interactions.

KEYWORDS

Computational Linguistics, Customer Experience Management, Customer Relationship Management, Data Mining, Deep Learning, Information Retrieval, Natural Language Processing, Sentiment Analysis, Student Experience Management, Text Mining

BACKGROUND OF THE CASE STUDY

In this article Arizona State University (ASU) is used as an example to illustrate how text mining can be utilized to manage and enhance student experience. ASU is the largest public research university in the United States under a single administration, with a 2016 student enrollment of 71,946 (ASU, 2017b). ASU is composed of six campuses spanning across the Phoenix Metropolitan Area (Tempe, West, Polytechnic, Downtown, Thunderbird, and Skysong Center). In 2017 the total endowment supporting ASU is $612.6 million (ASU, 2017c). However, while the student body keeps growing and the university is facing keen competitions, the administrator must find proper tools to respond to the challenges.

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ASU was founded in 1885 as the Tempe Normal School by an act of the Thirteenth Territorial Legislature. Its name was changed to the Normal School of Arizona in 1901 and became Tempe State Teachers College in 1925. In 1945, the school was under control of the Arizona Board of Regents and was renamed Arizona State College. These changes resulted from expansions of the curriculum and degree offerings. By 1958 the school performed all the functions of a regular university. As a result, a statewide ballot led the school to adopt the current name Arizona State University. Although research endeavors preceded attainment of university status in 1958, the development of new academic programs and library holdings and the conferment of doctoral degrees in the 1960s led the Carnegie Foundation to grant ASU Research I status in 1994 (ASU, 2017e).

In 2002, Dr. Michael Crow became the university’s 16th president. President Crow outlined his vision for transforming ASU into a “New American University,” an open and inclusive source of learning opportunities for all types of. Crow has stated that ASU is in a unique position to evolve together with the city into one of the great intellectual institutions in the world. In order to build a New American University, ASU has undergone some radical changes over the last 16 years. Like many universities, ASU has added new buildings, hired new faculty and brought in new students. More importantly, the core essence of New American University is open and inclusive. The preceding efforts might not yield the expected results if student experience is not well understood. Thus, under the leadership of Dr. Crow, the management style of ASU has become more data-driven, research-based, and student (customer)-oriented (ASU, 2017d). Over the last 16 years, ASU became one of the country’s fastest-growing research universities among those with $100 million+ in annual research expenditures. In terms of the overall growth rate of research spending ASU had outperformed Harvard, Yale, and Duke. While comparing with institutions without a medical school, ASU is ahead of Caltech, Carnegie Mellon and Princeton (ASU, 2017a).

EXPERIENCE MANAGEMENT: FROM BUSINESS TO ACADEMICS

Customer Experience Management

This case study illustrates the value of text mining of open-ended responses from student survey as a data source for improving student experience management (SEM). The concept of student SEM was borrowed from the idea of customer experience management (CEM), which was introduced by Pine and Gilmore (1998, 1999). Before the introduction of this concept, American corporations were either production-oriented or market-oriented. Based on the belief that the process is as important as the product, Pine and Gilmore asserted that successful businesses are those that understand the customer’s point of view so that ongoing improvement of customer relations is possible (Pine & Gilmore 1998). Pine and Gilmore (1999) differentiated between selling a product/service and selling an experience: “when a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages—as in a theatrical play—to engage him in a personal way” (p.2).

Although there is no consensus on the definition of customer experience, it is generally agreed that customer experience entails sentiments resulting from various interaction with the retailer or the service provider (Kandampully, Zhang, & Jaakkola, 2017). According to a survey administered by Gartner (Sorofman & McLellan, 2014), 89 percent of participated firms reported that they competed with their rivals on the basis of customer experience, and improving customer experience is one of the major strategies adopted by Marriott, Hilton, Starbucks, Disney, Starwood, and many others.

Greenberg (2004) used his experience in International House of Pancake (IHOP) to vividly illustrate what “selling experience” means. Greenberg and his wife visited an IHOP in Manassas, Virginia, only to find a long line of customers at the restaurant waiting to be seated. Looking at the tag assigned to them by the staff, his wife saw that it had a name (“Ashley Judd”) instead of a number.
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