Human Resources Management and Information Systems Trend Analysis Using Text Clustering

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ABSTRACT

Human resources management has seen a significant change by the emergence of information systems from a traditional or popularly called personnel management to the modern one. The purpose of this article is to study the trends of information systems in the field of human resources management in combination with information systems through text mining approaches on a broad exploration of internationally published papers. Among text analytics methods for extracting trends, text clustering has been applied to the dataset of highly-ranked information systems journals. The data set was obtained from Scopus database for the period of 2013 to 2017. Afterwards, text clustering algorithms were applied and validated on the titles, abstracts and keywords. The results present practical and intuitive information which can help practitioners and scholars to grasp a useful overview and provides them with the opportunity to focus on trends in information systems in the field human resources management.

KEYWORDS

Human Resources Management, Information systems, Text Clustering, Texts mining, Trends Analysis

1. INTRODUCTION

Nowadays, with the fast progressions in technology, we can gather vast amounts of different kinds of data. Data mining emerged as a method concerned with the extraction of practical knowledge from huge data (Han et al., 2011). Data mining could solve a variety of today world problem and it has been applied in different subjects such as management, health, finance, marketing and etc. Clustering is one of the data mining techniques where the data's labels are unspecified which is called unsupervised technique. Therefore, clustering can be applied to a variety of data including text (Aggarwal & Zhai, 2012). Text mining is a process of extracting knowledge or important pattern from unstructured texts (Hung & Zhang, 2012). In the text clustering, similar papers will group together and it is required to divide them into multiple clusters, papers in one cluster are similar to each other and different from any other clusters (Luo et al., 2009). We can use text mining technique including clustering to identify meaningful patterns, new trends and extracting knowledge from different kinds of text sources (Kao & Poteet, 2007). Researchers use text mining technique to find the patterns and trends from a vast number of data including academic papers (Lee et al., 2008). This research is deliberate to analyze and visualize emerging areas of information systems in the field of human resources, using text clustering technique. Considering the importance of this issue, there has been a lack of studies

in the past to analyze the emergent trends of information systems in the field of human resources. However, the main purpose of this paper is to investigate trends of the information systems in the field of human resources, by applying text clustering to the three parts of each paper: title, abstract and key words (Palvia et al., 2015).

This research addresses an important concern in the realm of human resources management. Since the last decade, there has been an increasing attention towards the optimal management of human resources, knowledge workers and talents. Talents and elites are considered the core competencies of enterprises and are named as 'Human Capitals'. They are of high value and significance to the success of businesses. The knowledge they possess, are of great importance to the smoothness of business progress and creating value-added for customers and business partners.

Such valued employees are also more sensitive and reactive to the strategic decisions made by top managers. For the purpose of effectively managing the human resources, especially human capitals, there has been continuous attempts to develop and implement information systems that are capable of efficient interaction with human resources in order to provide them with timely work information, social network infrastructure, informal groups' services, wage and salary analysis, and other value-added services. Accordingly, Human resources management systems have been under major developments and improvements in the last decade.

Modern human resources management systems have provided solutions for the knowledge storage, retrieval, sharing, and application across the boundaries of enterprises and their partners through the effective utilization of social networks and knowledge management systems, embedded within the human resources management information systems. This approach has gained a momentum and created a deep challenge in the future of software development in the human resources management realm. The abovementioned fact motivated the researchers to rethink about the future of human resources management solutions.

For the analysis of current and future trends of information systems in the realm of human resources management, this research has employed the text mining algorithms on the content of many validated papers so as to extract and analyze the trends of information systems developments and implementations. The access to the latest trends helps the practitioners and scholars in the field to keep the future changes and upcoming scientific trends under close scrutiny and to concentrate on the most recent and useful approaches to human resources management developments.

The layout of this research study is organized as follows: In section 2 we briefly review related studies of "human resources and human capitals", "text clustering". Section 3 presents the research method steps including data gathering from a well-known scientific database "Scopus" data set, the data preprocessing methods, document representation, and data mining. In section 4 we show analysis and results. Then, in section 5 we discuss the results and finally, section 6 outlines conclusions.

2. BACKGROUND

2.1. Human Capital and Human Resources Management

"Nothing is achieved in organizations without people". It is undeniable that people in the organizations are the most important assets which generally called "human capital" (Mayo, 2016). The concept of the human capital goes back to Adam smith, he noted human capital in his fourth definition: "The acquisition of –talents- during education, study, or apprenticeship, costs a real expense, which is capital in a person. Those talents are part of his fortune and likewise that of society…" (Smith, 1776; Diebolt & Haupert, 2016). Generally, human resources management has been described as being responsible for the attracting, recruiting, selecting, training, assessment and compensation of employees while ensuring compliance with employment and labor laws. It has also become involved in, business continuity planning, labor relations, succession planning, and workforce diversity. There is level of abstraction in human resources, three of them concentrates on HR systems, HR policies,

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