Improve business operation efficient through the use of automatic intelligent model building system

Morgan C Wang
University of Central Florida, USA.

Abstract:

Prescriptive analytics can be used to improve business operation, however, many constraints factors including (i) the shortage of high-quality data analysts; (ii) the time to develop a useful prescriptive model takes very long time; (iii) the lifespan of the prescriptive model is relative short prevent the usage of prescriptive analytics. Automatic intelligent model building system which is capable (a) of building prescriptive model automatically with relatively short time (hours instead of weeks or months); (b) being used effectively by IT personnel with adequate knowledge of data sources; and (c) deploying easily can be used to overcome all the constraints. Thus, it overcomes all shortages of traditional modeling approach and it can be used to improve business operation. A portal type of .Artificial intelligence (AI) continues to dominate the business and non-business environments amid various criticisms due to the fear that AI technology will endanger the role of people in future management and business operations. This article seeks to identify different approaches through which AI transforms business. This article includes analysis of the impact of AI on business from cost reduction in business operations, cyber security, marketing, innovation and improved management decision making. AI has multiple positive impacts on overall business operations, and management and business investment in AI will enhance sustainability and market leadership. This paper presents the design and implementation details of an Artificial Intelligent based smart building automation controller (AIBSBAC). It has the capability to perform intelligently adaptive to user preferences, which are focused on improved user comfort, safety and enhanced energy performance. The design of AIBSBAC consists of subsystems of smart user identification, internal and external environment observation subsystems, an artificial intelligent decision making subsystem and also a universal infrared communication system. Furthermore, the design architecture of AIBSBAC facilitates quick install flexible plug and play concept for most of the residential and buildings automation applications without a barrier to infrastructure modifications in installation. The emerging concept of smart buildings, which requires the incorporation of sensors and big data (BD) and utilizes artificial intelligence (AI), promises to usher in a new age of urban energy efficiency. By using AI technologies in smart buildings, energy consumption can be reduced through better control, improved reliability, and automatic intelligent model building system has been developed. It is capable of fixing data problems such as missing values, skewness and high cardinality. It supports neural network, decision trees, gradient boosting, rand forest and many regression algorithms. This system also attempts to open the black box to allow the user to see some insight of the modeling results such as interaction among predictors, important predictors, how to alter predictors to change the predicted values. Two case studies will be discussed to demo the capability of how to use this system to enhance business operation. The first case study is to a precision marketing system. The second case study is on employ management system. The results from both cases studies are very positive and encouraging automation. This paper is an in-depth review of recent studies on the application of artificial intelligence (AI) technologies in smart buildings through the concept of a building management system (BMS) and demand response programs (DRPs). In addition to elaborating on the principles and applications of the AI-based modeling approaches widely used in building energy use prediction, an evaluation framework is introduced and used for assessing the recent research conducted in this field and across the major AI domains, including energy, comfort, design, and maintenance. Finally, the paper includes a discussion on the open challenges and future directions of research on the application of AI in smart buildings.