Firstly, big data analytics tools make it possible to uncover hidden correlations which could not be detected efficiently in the past. Prior to the advent and widespread adoption of big data analytics tools, a common belief held that everything in the world follows a specific law. For instance, the falling of an apple from the tree follows from the law of gravity, which was stated by Isaac Newton. With this belief, the question was deduced to find the hidden rule behind observations of the real world. A famous example of human beings’ success in processing huge amounts of data was the discovery of the Kepler’s Laws. Kepler, the well-known astronomer, continued the research of the rules of planetary motion on the basis of the observed data that came from another astronomer, Tycho Brahe. However, such cases are rare in the history of science, because manipulating so many numbers requires massive calculation, which is historically challenging. Besides, as data continues to explode, many data types that humans cannot calculate straightforwardly arose, like the boolean values. Hence, alternative methods are urgently needed, and big data analytics tools are well-suited for this. In fact, big data analytics tools that have matured have proved their indispensable value. In a 2022 research, researchers demonstrated that big data analytics tools could find hidden correlations implying cause and result relationships, which was hard for humans to investigate (Ren, 2022). In this research, big data analytics tools such as deep learning helped to uncover the underlying cause of production bottlenecks of a factory, which was the delay in logistics rather than the crash of cash flows. Also, such tools also helped to find the correlation between the weather patterns and the logistic delays across disparate datasets, which greatly helped the logistic company. Collectively, these cases exemplify the capacity of big data analytics tools to uncover hidden correlations, not to mention that such tools also make it possible to process vast quantities of data with the help of computer science.

Furthermore, big data analytics tools also enable personalized experiences by powering recommendation and decision systems across industries. The most significant influence on recommendation systems lies in the field of E-commerce platforms, especially in China. With methods like pop-up advertisements, companies strive to enhance precision marketing strategies leveraging big data analytics tools. Through a series of steps: data preprocessing, user profiling, user clustering, repurchase behaviour prediction and recommendation algorithm research, users’ needs are taken into account when providing them with accurate product recommendations based on their diverse and personalized characteristics. Research shows that such introduction of big data analytics tools into the strategies-making process could improve the marketing model’s precision by 78.8% (Luo, 2024). Moreover, beyond precision marketing, keeping track of users’ interests and dynamically making adjustments to strategies are also powered by big data analytics tools, without which humans lack the capacity to continuously monitor every customer around the clock and perform the necessary calculations with sufficient speed. The same research involved the construction of RFM (Recency, Frequency, Monetary) models, which could segment users dynamically, enabling targeted promotions. Such capabilities enabled cross-industry applications driving tailored outcomes. Big data analytics tools could be used not only in recommendation systems for commercial benefits, but in areas like education and medicine. In a 2024 study, researchers designed big data models analyzing students’ cognitive patterns to adjust curricula for students with diverse learning styles, therefore enabling teaching students according to their aptitude possible (Thimmanna et al., 2024). Also, customized teaching materials not only enhanced comprehension, but also fostered a more inclusive learning environment by accommodating different academic strengths and weaknesses. Other benefits such as facilitation of collaborative learning, promotion of lifelong learning and providing data-driven insights into educational policy making are also confirmed. Additionally, big data analytics tools are playing an increasingly important role in personalized medicine. Today’s healthcare workforce is faced with the availability of massive amounts of patient- and disease-related data. In a review article in 2016, researchers provided an overview of personalized medicine and came to the conclusion that when mined effectively, these data will help produce more efficient and effective diagnoses and treatment, leading to better prognoses for patients at both the individual and population level (Estape et al., 2016). All these examples showcase big data analytics tools enabling personalized experiences through recommendation and decision systems.

