Data Science for Sustainable Development: A Systematic Literature Review

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ABSTRACT

Sustainable Development goals (SDGs) agreed in 2015 by all 193 member states are expected to convert the world into a more sustainable one. These goals provide a solution to sustainability issues with regard to nations' economies, the natural environments and the societies. Unfortunately, it has not shown satisfactory progression. It has now become a challenge to achieve SDGs by 2030. Therefore, it is of paramount importance to identify synergetic goals which has a high positive and low negative impact on other goals' attainment when improved (Pincet, Okabe, & Pawelczyk, 2019). A SDGs consists of an expanding list of 231 unique indicators. However, the SDG Index has been introduced to measure the progress of each country's performance on SDGs (Sachs, Schmidt-Traub, Kroll, Lafortune, & Fuller, 2016). It has been shown that contributions of all SDGs to form the SDG index, not all of them have relative or equal importance. Using machine learning, the order of importance was shown to be SDG3, ''Good health and well-being"(42%), SDG4, ''Quality education"(24.8%), SDG7, ''Affordable and clean energy"(8.6%), SDG9, ''Industry, Innovation and Infrastructure "(5.1%) followed by other SDGs (Atie Asadikia, Abbas Rajabifard, Mohsen Kalantari, 2021). This systematic literature review intends to cover SDG4 (24.8%) and SDG9 (5.1%) which in turns amounts to almost 30% of the individual contributions of SDGs to SDG index. Furthermore, relative or equal importance of SDGs are shown to vary with the level of the country. The countries with above average SDG index, SDG4 (2.53%) and SDG9 (10.69%) amounts to a total of only 13%, whereas the other countries amounts to SDG4 (34.33%) and SDG9 (8.96%) giving a total of 43%. In a quantitative time-series analysis which investigated the correlation among SDGs indicators, SDG3 has ranked as the top synergetic goal (Pradhan et al., 2017). This shows how the pandemic situation prevailing in the world adversely effects the achievement of SDGs. In this study, it is shown that interactions occur between SDG9, ''Industry, innovation and infrastructure", and SDG4. Identification of synergetic goals and correlations among SDGs paves the way to allocate resources which make it possible to achieve of those goals and boost the SDG index of the country significantly.

Key words – Sustainable development, data science, education, industry innovation