

Rwanda's progress in embracing Big Data

In May 2019, the National Institute of Statistics of Rwanda (NISR) inaugurated its brand new Training Centre that is designed to be a convenient environment for data access and capacity building. It will also host the NISR Data Science Campus that will be the hub of big data analytics and their applications. The big data hub will be an environment for capacity development activities in new areas of data analysis such as data science, artificial intelligence, machine learning and other big data related techniques, not only in Rwanda, but also in the region.

Given the relevance of the big data hub to Rwanda and Africa, NISR realizes that partnerships and collaboration with other institutions and organizations is needed to achieve its mission. It is in this context that, in March 2020, Rwanda signed a memorandum of understanding (MoU) with the United Nations to operationalize this hub which is expected to start before the end of 2020. Furthermore, the MoU agreed that Rwanda would host the only big data regional hub for Africa.



Rwanda and UN, Regional Hub for Big Data, Ceremony of signing the MoU, March 2020

The 5th International Conference on Big Data for Official Statistics held in Kigali in May 2019, reinforced the role of Big Data in the era of Sustainable Development Goals. Big Data is important to high-level decision making and is among the aspects of the 4th Industrial Revolution that is already picking up pace across the world as firms seek to increasingly use data to improve productivity, efficiency and value.

Rwanda is keeping pace with this agenda of big data. In 2017, the cabinet approved the data revolution policy and its implementation is under the coordination of NISR. This policy has the mandate to build big data and analytics capabilities within Rwanda.

In this context, many areas were identified where big data analytics will be used to avail useful insights for evidence-based decision making, and they span many sectors of country life. These include the analysis of satellite imagery to monitor crop production and the analysis of mobile

phone data, including transactions, to understand the population's mobility. All of these initiatives require specific skills, tools and a supporting infrastructure. The regional hub of Big Data will enable Rwanda to transform all of these initiatives from being of one country to regional and world initiatives.

To build the national capacity for big data analysis, Rwanda has three universities offering courses and short term trainings related to Big Data (including vital skills for how large structured and unstructured datasets are analysed) and Data Science. These universities are: the African Centre of Excellence in Data Science at University of Rwanda, the Carnegie Mellon University/Rwanda and African Institute for Mathematical Sciences (AIMS). Interestingly, these higher learning institutions are also in the same line with the regional hub of Big Data to be hosted at NISR by training young data scientists from not only Rwanda but also from other countries in Africa.

Alongside these universities, some institutions and companies in Rwanda are establishing data science teams that will help them to deal with extremely large data sets and computationally analyse them to reveal patterns, trends, and associations, especially relating to human behaviour and interactions. In this context, public institutions such as Rwanda Utilities and Regulatory Authority (RURA), Rwanda Revenue Authority (RRA) have already established Data Science Teams and others like the National Bank of Rwanda and many more will soon establish their data science teams. Private institutions, such as Bank of Kigali (BK), are also strengthening their own data science teams for the same purpose. Their collaboration with the regional hub of Big Data at NISR will be a channel to communicate with other institutions in the world to share experience and skills.

To further strengthen the use of Big Data across the continent, Rwanda will always be open for more strategic partnerships and collaboration with other institutions, being private or public, at national, regional and international levels. For example, the UK Office of National Statistics (ONS) has been supporting NISR to coordinate the whole data revolution policy. This kind of partnership is valuable to share experience towards leveraging opportunities offered by data science to solve existing problems and predicting the ones that may occur in the future.

Finally, and most importantly, throughout all of its work, NISR is ensuring that all personal data is used in a lawful manner. Rwanda has had a strong understanding of this obligation from the start and is now in the process of putting in place its Data Protection Law that will improve the accessing, sharing, analysis and use of big data without breaching the privacy of individuals.

NISR and other institutions in the coordination mechanism of Data Revolution are ensuring that this law is complementing with other legal instruments for data production, data access, data sharing, data analysis, publication and use in Rwanda, region and the entire world.