



**Government of the Republic of Trinidad and Tobago**

**Address**

**by**

**THE HONOURABLE STUART R. YOUNG, MP**

**Minister of Energy and Energy Industries**

**and**

**Minister in the Office of the Prime Minister**

**at the**

**United Nations Big Data Forum**

**On**

**The Transformational Role of Big Data Technologies and Analytics- Big Data**

**Technology, the Energy Sector and the Economy**

It is my pleasure to participate in the second instalment on the UN Trinidad and Tobago's role of Big Data Technologies and Analytics. The amount of data generated globally has been and will continue growing exponentially in the future. The current reality is that the world is being powered by big data. What is driving this development?

Today, people as well as businesses generate data from millions of sources at an unprecedented rate. These data sources include the increasing number of internet users conducting daily online transactions, the trend by organizations to digitization and the capacity of advanced embedded devices and systems to collect and share data.

Once global data started to grow it has shown no signs of slowing down and it will not slow down. It's aggregated mainly via the internet, including social networks, by Internet of Things (IoT) devices and sensors. These are the key drivers for the global big data market growth.

Surprisingly **Big data** is still an enigma to many people as it is a relatively new term and while it may still be ambiguous to many people it has become increasingly important for reasons which I will demonstrate. This vast assemblage of data which is referred to as big data is huge in size, hard to stock, investigate, and transform with conventional tools of management. This data is complex and cannot be processed by traditional methods.

Big Data is set to eventually take the lead in various business aspects such as research, sales, production and business planning, thereby leading to a new industrial revolution. The technology has substantial opportunities and the capability to uncover profound insights when explored. Given its capabilities, data is steadily

being integrated into the private organizations as well as the public sector and is becoming vital to decision making. With mobile phones and access to internet becoming the norm, the public sector itself spawns a mammoth amount of data in energy, education, employment, agriculture, and manufacturing.

Data science is significantly aiding governments in becoming more efficient, detecting and minimizing fraud, maintaining transparency, boosting the economy and productivity. This is being achieved by public sector organizations collaborating with the private sector to deliver services more effectively, swiftly and with greater precision to meet the needs and requirements of the citizens.

This surge in data has led to the rise of big data analytics. It is the complex process of analyzing big data to help organizations to make informed data-driven business decisions, and to use it to identify new opportunities, for more efficient operations and higher returns on investment. This is the age of big data, and the use of data analytics will become more and more extensive across industries. Data has been coined as the new oil of the digital economy.

The Internet of Things (IoT) has enabled everything digital to be connected directly or indirectly. This hyper-connectivity between people, data, processes, and things is disrupting the way data management and analytics used to be. One of the challenges is how do we safely harness the data.

New integrated platforms share data across groups and devices, making connections like never before. The increase of Internet-connected devices across all industries has fundamentally altered how companies do business. Data analytics make it possible for companies to automate and refine their day-to-day operations. As a result, businesses that leverage data analytics are able to make effective real-time

decisions, enabling them to achieve more value, and increased organizational efficiency in a short we space of time than previously.

Many national and international organizations, in collaboration with governments, are resorting to the application of big data analytics across various sectors that benefit the society and improve the economy in all sectors including oil and gas exploration, natural resource management, banking and securities, manufacturing, insurance, healthcare and education.

Trinidad and Tobago is a member of a globalized international community which has undergone significant change as a result of scientific, technological development and innovation. Government as part of the digital transformation is using Information and Communication Technologies (ICT) as the vehicle for the delivery of public goods and services and strengthening of institutional capacity. All Government entities are now online and information on Government services can be found on the government portal, tconnect. The aim is to deploy ICTs to transform operations of Government Ministries and Agencies to a state where digital becomes the default, yielding time and cost savings, delivering services effectively and efficiently. The government intends to use ICT more and more to reduce inefficiency and increase productivity.

The ultimate objective is to create a digital economy in which electronic transactions are the norm in doing business, in which we become a supplier of digital goods and services and in which our citizens are equipped with the skills and access to apply technology online productively. To this end we will be embarking on enabling e-legislative framework, a digital developer incubation hub and a technical digital skills training programme. This investment in human capital will serve to empower

individuals and innovators who can work closely with governments and the private sector to improve data collection methods and analysis of capacity of public and private institutions to optimize the productive utilization of their resources.

A core requirement for big data analytics is access to affordable and fast Internet. Governments of developing countries are rolling out national fiber-optic backbones within their countries to increase access to reasonably priced broadband connectivity. Trinidad and Tobago is in the forefront of this development. We have provided and continue to provide free broadband access in highly populated areas and underserved communities as well as fully operational ICT Access Centres. We aim to increase these initiatives.

Regionally a Task Force has been established by CARICOM to provide an opportunity for the Region to deliver a more collaborative, coordinated and innovative approach to meeting the digital skills challenge. The objective being to address digital inclusion and to proliferate digital skills across CARICOM in a comprehensive, strategic manner to add another important layer to being “**A Community for All**”.

To this end the CARICOM Secretariat will be embarking in 2022, on an ICT Sector gap analysis across the whole of CARICOM, with funding provided under the 11<sup>th</sup> European Development Fund. This gap analysis will support the efforts of the Regional Governments, including Trinidad and Tobago in the identification and quantification of critical parts of our digital infrastructure, and to help to fast-track digital transformation.

Data analytics are facilitated by **Big Data Technologies** which utilize software that incorporates data mining, storage, sharing, data visualization, data framework including tools and techniques used to investigate, transform and analyze data. The harnessing of the power of big data analytics tools and techniques provide the users with the means to examine data sets and derive actionable insights.

Data analytics and Business Intelligence platforms come in a variety of shapes and sizes to meet the ever-changing needs of organizations and their increasingly complex big data environments. The market is dominated by blue chip companies such Microsoft, IBM, Oracle and Google. However, there is room for start-up companies to define their space in this evolving technology. This is the rationale behind the establishment by Government of a digital incubator hub , the grant of tax exemption and a research and development capital allowance to companies whose core business activities are digitization and technology solutions.

Big data is already transforming business, Governments and other aspects of the economy. The Organization for Economic Co-operation and Development (OECD) has determined that countries will benefit greatly from data analytics in terms of economic and social gains with increased investment in “Big Data” , data sharing and reuse. However, there must be a balance between the sharing of data and individuals’ and organizations’ legitimate concerns with respect to privacy, security and intellectual property rights.

Data and data analytics have become an essential driver of innovation akin to scientific research and development . In this regard the infrastructure in the digital economy include not only broadband networks and cloud computing, but also data itself.

Industries that have been assessed to benefit most from the use of big data and analytics include the travel industry, energy, insurance, finance and agriculture. In the case of energy and particularly the oil and gas industry, its massive datasets have grown with the advent of data recording sensors in exploration, drilling and production operations. This has led to the use of Big Data and Analytics by companies to recover more oil and gas out of hydrocarbon reservoirs, reduce capital and operational expenses, increase the speed and accuracy of investment decisions, and improve health and safety while mitigating environmental risks. A study undertaken by Accenture and Microsoft of oil companies established that 86% to 90% of respondents said that an increase in their analytic capabilities, use of mobile technologies in the field and banking more on Industrial Internet of Things would increase the value of their business.

Other Studies have shown that companies employing that big data would generate higher added value, productivity and output growth than their peers. From a Government perspective it was determined that the employment of Big data and Analytics would boost annual income, reduce corruption, improve better workplace conditions, increase energy efficiency, and improve foreign trade.

The worldwide big data and business analytics market, that was valued at USD 193.14 billion in 2019 is projected to increase in value to USD 420.98 billion by 2027. The surge in adoption of big data analytics software by various organizations to deliver enhanced and faster decision-making contributes toward the growth of the global big data and business analytics market. In addition, an increase in demand for cloud-based big data analytics software among small and medium enterprises positively impacts the growth of the market.

In Trinidad and Tobago based on contribution to gross domestic product (GDP) the energy sector will benefit from Big Data and Analytics with a contribution of 33% of GDP the energy sector is the major contributor to the economy. The energy industry comprises four sectors, the upstream oil and gas sector, the midstream sector, the downstream sector and the power industry.

The upstream sector is responsible for the exploration, development of crude oil and natural gas. The midstream is responsible for transportation and distribution of crude oil and natural gas. The downstream utilizes natural gas as feedstock in the production of finished product. The Power Industry is responsible for power generation and transmission.

While all components are inter-related the upstream is the life blood of the domestic energy sector. The upstream has developed from a fledging sector 1200 barrels of oil equivalent per day in the early 1990s to the current production of 550,000 barrels of oil equivalent per day. How did it achieve this transformation? The answer lies in advances in technology.

The oil and gas industry has always been in the forefront of technological change. The past decade has been marked by the presence of digital technologies from process digitization to robotics and automation and advanced analytics powered by machine learning, artificial intelligence (AI) and Internet of Things. These technological advances and the improvements in seismic acquisitions devices, fluid front monitoring geophones, carbon capture and sequestration have provided vast amounts of data to be processed and analyzed.

All this data combined makes up Big Data. But, Big Data in its raw form is of very little use. Big Data analytics is the process used to extract among other things



meaningful insights, such as hidden patterns, unknown correlations, market trends, and to facilitate better decision making.

Processing large amounts of generated data by an individual for a complex problem is impossible and results in significant delay and uncertainty . Real time and fast processing of data is crucial in oil and gas industry. Big data analytics enable the rapid processing and analysis of large amounts of data sets. In the energy industry we can distinguish different cases for using big data analytics. In upstream big data analytics are used to store, to analyze seismic data, to optimize drilling processes and to improve reservoir engineering in locating petroleum resources. In the midstream big data infrastructure is used to store and to analyze transport data in real-time to ensure the safe logistics of their energy product. In the downstream big data technology has been employed to reduce downtime and maintenance costs of the refining equipment, thus improving asset management. In the Power Industry, data analytics enable providers to deliver new services and savings to customers through utility-led energy efficiency programs and predictive maintenance. In summary big data analytics enable companies to transform enormous datasets into sound decisions, reduced operational costs, extended equipment lifespan, and lower environmental impact.

There is a correlation between the effectiveness of analytics projects and the adoption rate of advanced technologies. Technology acts as an enabler for business transformation. Advanced analytics technologies make organizations more agile in terms of keeping pace with changing business trends and customer needs.

There are tremendous benefits to be gained from the employment of big data analytics by the domestic energy industry. The application by upstream companies

in the application of big data analytics has provided a major boost in the identification of hydrocarbon resources in the exploration activities of oil and gas companies operating in Trinidad and Tobago.

In the Midstream State owned National Gas Company of Trinidad and Tobago owns and operates a pipeline distribution and transmission pipeline network of approximately 1000 kilometres of onshore and offshore pipelines for the supply of gas to final consumers .On a daily basis, a substantial amount of data is either generated in order to manage the pipeline network safely, and to ensure that it is operated optimally. To this end NGC has developed a 3-year Technology Strategy to use data as a strategic asset, to improve its agility in decision-making, its operational safety and reliability, and process efficiency. The key elements include a Business Intelligence (BI) and an Analytics programme which are augmented by a data warehouse and the implementation of Industrial Internet of Things (IIoT) technologies . The use of IIoT and Big Data analytics will improve the detection of pipeline leaks and predictive maintenance thereby reducing downtime and operating expenses.

In the downstream sector, there is a universal recognition of the value of big data technologies and analytic. Digital technologies can play key roles in process plants and allow efficient information sharing and data analytics. Using the insights provided by these technologies can help drive greater asset reliability, lower operating costs, reduced risk and enhanced operational performance. In this regard companies have sought to establish within their organizations a data and analytics capability to improve performance and create value in new and innovate ways.

The Power sector of Trinidad and Tobago has one of the lowest electricity rates in the world consequent on the subsidy borne by the State. Power generation planning,

and economic load dispatch are the two most important decision-making processes in power generation. By the application of big data analytics T&TEC will be able to effectively match energy supply and demand on the grid thereby improving energy production efficiency and reducing production costs. This ultimately leads to a reduction in the financial burden on the State.

In 2022 the construction of the country's first renewable energy project, a solar utility project with a capacity of 112 megawatts is scheduled to commence. Solar energy is another important grid component that can benefit from Big Data analytics. However solar energy can be variable and therefore weather conditions can significantly affect the output of the solar utility project . By processing weather data ,such as temperature, atmospheric pressure, humidity, cloud cover, data analytics, will enable a more accurate and efficient forecasting of solar power generation. The information generated will allow for consolidation with loads from other sources by the grid to provide reliability and to reduce cost.

Data Analytics can provide information to ensure a cleaner environment by creating a more efficient industry which would assist in less carbon emissions and better use of energy resulting in overall lower costs.

In this regard Trinidad and Tobago has launched a digital platform for tracking carbon emissions and mitigating their impacts, known as the Knowledge Management System (KMS). It is the central database of the National Climate Mitigation, Monitoring, Reporting and Verification System. The KMS is a web-based database designed to identify, collect, record and analyze data and information coming from different sources and institutions. The System provides an interface between Government and Stakeholders and allows for a continuous flow of verified data that tracks the progress in reducing carbon dioxide emissions.

Big data, artificial intelligence and machine learning have witnessed exponential growth over the past few years. With the evolving technology, businesses realize the importance of incorporating big data and AI in their operations. While the technologies create exciting new opportunities for companies and entrepreneurs their adoption is also partnered with several complexities and risks, hence, the need for regulations.

Regulators and policymakers find it difficult to keep track of the constant developments in technology and AI systems. Regulators on the global governance level are trying to keep themselves updated with the growing number of AI developments to ensure the laws and regulations stay relevant with new challenges and inventions.

The regulations define the enhancement of the public sector policies and laws for the use and promotion of big data, AI and machine learning technologies. The laws and regulations are mandatory to manage the associated risks with big data and AI.

The Ministry of Energy and Energy Industries (MEEI) is responsible for the regulation of the Petroleum and Minerals Sectors in the Republic of Trinidad and Tobago (T&T). The Ministry is the recipient of data emanating from exploration and development of hydrocarbons and quarrying activities. This information is received daily, monthly, quarterly and “As Needed” from Operators from these sectors via an MEEI online portal, emails as well as hard copy submissions. Based on specific legislation, the data required from Operators has been standardized to facilitate better analysis. Moreover, the MEEI employs industry standard applications in the analysis of unstructured and semi-structured data sourced from these sectors. Big Data

Technologies and Data Analytics will allow MEEI not only to administer the Energy and Mining Sectors but also to assist Operators to function more efficiently.

Big Data Technologies can be implemented alongside various digital platforms to allow for an even greater ecosystem. This augurs well for digital platforms already in place such as the Enterprise Geographic Information System and the Ministry's proposed National Energy Data Repository (NEDR) .

The Enterprise Geographic Information System has been implemented to facilitate the storage, sharing and dissemination of geospatial products such as maps and data. Further development of the system would allow authorized users to have access to information via the click of a button through an online platform, where one can view a map and see what data is available and to determine interest.

The National Energy Data Repository will provide physical access for data viewing of archived data by stakeholders as well as online access to digital data. This project is an extension of the work already in the pipeline to build the MEEI corporate master data store as well as the existing need for suitable storage for the MEEI's energy data. All energy data that is collected by the MEEI will be amalgamated into a National Energy Data Repository. Big Data technologies will allow the Ministry to extract and process data stored and captured in National Energy Data Repository in its management of the sector to the benefit of the people of Trinidad and Tobago.

In keeping with Government's 2030 vision to be a leader in digitization, MEEI has realized the strategic value in big data technology. Currently in the early stage of planning and implementation, MEEI is well on its way to full adoption of big data technology and data analytics, as well as establishing a NEDR in alignment with the Government's objective.

As the world continues to advance in the use of technology, so should Trinidad and Tobago in its approach to data capture, storage and analysis. While facilitating data interoperability and exchange between authorized stakeholders, the ICT-based systems that are used must ensure security of confidential data.

The adoption of Big Data Technologies and Analytics will facilitate more efficient regulation ,improve decision making, make operations more efficient and Improve business performance. Ultimately the use of the technologies would benefit the economy and by extension the people of Trinidad and Tobago.

Big data has been shown to create substantial value in many sectors, that translate to productivity improvement for economies, and bring consumers benefits and conveniences. However, the barriers to overcome are just as real as the potential of the technology. Investment in Technology alone will not be sufficient to derive the benefits of big data and analytics . Shortages of talent, inadequate management practices, and data policy and security issues will need to be overcome to ensure that the economic benefits are derived. Therefore understanding the positives and drawbacks is critical in order to reap the benefits of big data and analytics. What is clear is that big data and analytics is not limited to big companies. It is becoming widespread and is seen as important technological tool for progressive companies and institutions.

I thank you.

