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Data is the new oil for GCC



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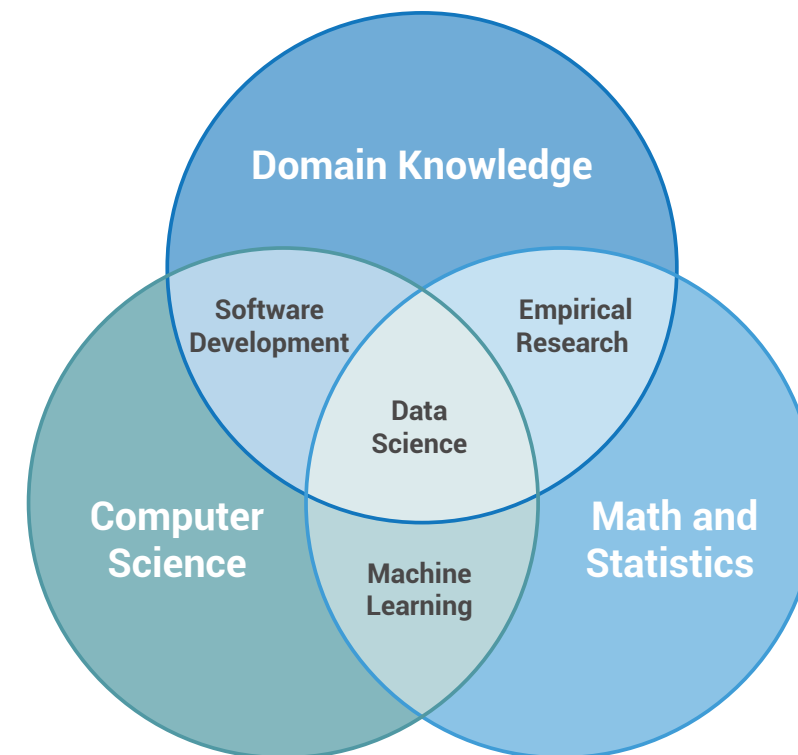
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Introduction

Information and Communication Technologies (ICT) is increasingly changing the data landscape and is significantly impacting every aspect of human lives, including businesses, science, and governance. Data Science is the collective process that uses theoretical, mathematical, computational, and practical methods like algorithms, and statistics to review, analyze and extract valuable knowledge and information from raw data. Also referred to as datalogy, it enables individuals and organizations to extract required or valuable information that may be used for multiple purposes, such as decision making, product development, trend analysis and forecasting.

Exhibit 1: Intersectionality of Data Science



Source: Management Circle

Experts believe that there are two distinct data science for humans and machines. In the first instance, the focus is on getting insights from complex data sets by applying technological tools and solutions. The ultimate decision maker and the end consumer of the analysis in this case is another human being. In the second case, the focus is to find machine based, automated solutions for data processing, modeling and decision making. The ultimate decision maker in this scenario is a computer.

Data science is a synthesis of statistics, advanced computing technology and AI¹. The strategic advantage lies in the integration across assorted and interdependent complex data resources to support real-time decision-

¹ Department of Science, India

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making. The transformation of large data sets and associated data into practically actionable intelligence is the underlying promise of Data Science.

In the GCC region, the state remains a major force in driving the economic progress and social welfare. Data science is a key enabler for governments as they seek to deliver targeted and better services to the public in different realms. United Arab Emirates have taken leading strides in shifting their service delivery operations to cyberspace, through its e-government and smart government transition into virtual space.

Launched in 2014, Dubai Smart City (DSC) is a perfect example of how governments in the region can unlock the potential of big data to enhance their services. DSC facilitates the transformation of multiple Dubai government services including transportation, communications, infrastructure, electricity, economic services, and urban planning into smart transactions centering on the internet. DSC's strategy draws on communication, integration and collaboration, thereby enhancing communication between the city's residents and its institutions and facilities through convenient access to and sharing of data about the city. The data collected and analyzed by the smart city helps in improving predictive models of services at different levels and is not exclusive to the government. A system of communication which inculcates the feedback from the citizens is the first step towards a successful policy creation.

Data is the New Oil?

The volume and type of data available at present is continuously increasing and changing. The primary reason for such growth is that more people access and use more tools that have the potential to create and share information than ever before. Further, the data collected is complex and unstructured. 90% of the data that currently exists had been generated in just the last two years. This has led to experts predicting a 4,300% increase in annual data production by 2020, meaning that data production will be 44 times greater in 2020 than it was in 2009.

Exhibit 2: Present and Future of Data Generation



Source: IBM

In this context, new technologies are being developed for more sophisticated manipulation and analysis of data. The data explosion brings multiple levels of challenges to the forefront, in comparison with the traditional approaches to empirical research and data analysis, making it evident that the new data reality cannot be met without new, technology-driven, techniques. Therefore, awareness of new technological capacities and opportunities is creating demand for advanced forms of data usage such as real-time analytics, automated data processing and decision-making through machine learning and deep learning.

Availability of leadership commitment, state of the art technology and infrastructure foundation serve as advantages to the GCC countries to set ambitious targets in terms of being leaders in data science. This is evident from the GCC government initiatives like UAE's Smart Data Strategy, Tasmu Qatar, KSA Open and Big Data Strategy and Bahrain Open Data Strategy. As a first step, these governments should consider using datasets that are already available internally, before venturing into overly complex use cases that require datasets that might not be available directly.

Harnessing the Data for Insights

Data science is defined by the OSEMN model and operates through five major steps.

Exhibit 3: Steps in Data Science



Source: O'Reilly

The data undergoes the process of *scraping* which involves extracting and converting the data from websites so that it is made ready for further analysis. Web scraping simplifies and automates the entire process of extracting data, and storing it locally in any format that the user wants. To capture the patterns and behavior of the data, it is represented in models. A *decision tree* is a predominantly used modelling technique for regression and classification. A decision tree is a flexible object that can describe many real world processes and allows different data to be used as predictors based on the context.

Topic modelling is another automated technique of finding groups of words that commonly occur together. This is used by policy makers as it generates easily comprehensible findings. Historical data can be used to compare the modelled outcome with the actual outcome and produce rates of false positives and false negatives.

Sources and Stakeholders of Data for Policy Making

As the impact of data becomes visible across domains, one area that has gained attention is how data has the potential to reduce uncertainty about the best course of action in policy design and implementation. The means of converting nontraditional information sources such as text, images and transactional records into data has created the opportunity for policy makers to have a deeper, data-driven insights into various issues.

Better Governance through Data-forward Approach

The penetration of data science into public policy is facilitated by the creation of government databases. Growing demand for transparent data, accountability and responsiveness from governments is resulting in more and more governments deciding to open up and make their data accessible. The launching of Digital Government in 2012 by then U.S. president Barak Obama was a key milestone in data science being used for constructing governmental policies.

For instance, the city administration of San Francisco (U.S.A.) has deployed data science approach to reduce frequent traffic collisions in the area. This led to establishing a mechanism for continuous mapping and visualization of traffic-related incidents across the city, and identifying where the main problems occurred. The insights gathered from this was transformed into policy solutions which included key factors like introducing protected intersections, underway intersections and protected bike lanes as some of the measures to combat the issue.

Across the world, people are equipped with different technological solutions in the form of phone apps that connect people with public services, various types of sensors etc. provided by governments and other stakeholders, which improve citizens' well-being and the general functioning of the cities. But despite the rapid adoption of advanced technologies, the governance structures of today are unable to extract relevant policy insights from the amount of data collected due to lack of the knowledge, skill and technical expertise. Data science can help in this case.

Need for Greater Academic Focus

The potential of data science in governance and policy making has garnered the attention of academic and research institutions. Universities are developing specialized programs to provide students and the community with knowledge and skillsets that are in line with the technological developments. Blended academic disciplines like 'Computational Analysis and Public Policy' which combines a traditional public policy curriculum with computer science training is an example.

Empowering Non-Government Actors and SMEs

As technology trends shape the public governance and policy making, there is a growing awareness that such trends should be followed by civic societies in order to ensure better governance, accountability on implementation aspects and influence on policy making by non-institutional actors. Initiatives such as Civic Analytics Network and Data Science for Social Good use data science to solve real-world, community problems, and provide the necessary tools or tech-infrastructure as well as educate professionals and empower civic society to participate in policy making by using technologies and data science solutions, which can benefit stakeholders requiring support (like SMEs).

Data Science Initiatives in GCC countries

The GCC countries have implemented focused efforts to build comprehensive programs and strategies in using big data. The significance of data science in driving the national visions of these countries have made it even more urgent. The different initiatives of GCC governments to harness data are as follows:

Bahrain is implementing Open Data Strategy for the Kingdom, which encourages and enables the use of public data to push the development of society and economy as a whole.

Qatar launched the TASMU program which is aimed at positioning the country as a leader in the area of smart city technology and ICT. A platform of platform is being developed which will be connected to specific sectoral platforms and will collect data of each relevant entity.

Saudi Arabia initiated a big data strategy and cyber security initiative where new data protection laws are expected to be implemented soon.

UAE implemented the Smart Data strategy built on key national policies to support the development of Smart and Open Data. Smart Dubai has partnered with IBM to open a Data Lab to enhance data science skills in society.

Oman Ministry of Manpower's open data portal enables policymakers in the government, the private sector, researchers, and members of the public in general to use government open data, and make use of this data in an easy and effective ways.

Kuwait established the National Knowledge Economy Center (NKEC) which is developing big data projects like e-cloud system in Public Authority for Industry, GIS systems with special sensors at the Environment Public Authority etc.

Dubai Data Strategy

In April 2019, Smart Dubai introduced the Dubai Data Private Sector Strategy and Policy that aims to provide an ideal data ecosystem towards its development of data driven paperless smart city. The strategy facilitates the technological transformation in collaboration with the private sector. As a part of this, Smart Dubai recently partnered with the leading real estate portal Property Finder to leverage new technologies in the real estate sector. Such a partnership will harness the data available with the government entity and the expertise from the private sector to develop new real estate products.

Future Directions for Data Science in Policy

Forecasting and resource allocation are used in short term and medium term planning. Government departments and agencies can use data science to examine how the various components of national policies, particularly those focused on vulnerable groups, worked or failed in the past. This ensures that the interventions are targeted more systematically. Cost-benefit analysis using data science generates better results.

The new data environment creates new opportunities to governments and other stakeholders involved in policy processes. Therefore, every actor including governments, universities, think tanks and civic movements will have to strengthen their data science capacity. This implies that data scientists, along with researchers, and analysts would play a key role in the analysis of public polices and the formulation of workable policy narratives.

In order to use data science effectively in policy making, the GCC countries should start developing robust foundation necessary to store, share and analyze the data. Forming the right governance structure is a critical yet widely overlooked step in this process. As various organizations and multiple levels of data usage is involved, governance bodies should be empowered to implement initiatives across the different entities. Establishing big data functions as a cross governmental initiative like in the case of UK’s Data Advisory Board which is responsible for driving better use of data across government and enabling cross government collaboration is an advantage. Further GCC nations should define data standards and principles and develop a practice of promoting data sharing. In terms of skillsets, GCC region still extensively relies on the foreign talent with respect to analyzing big data. This could be a challenge in terms of using data science in policy.

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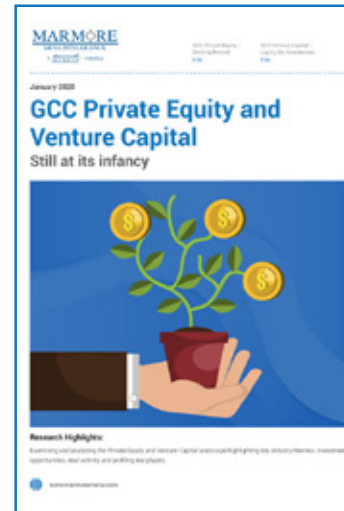
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