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Indian National Statistics Day 2024: Celebrating the power of data for decision making

Abstract

On National Statistics Day, we honour P.C. Mahalanobis's contributions to statistics over the years and his idea of using statistics to advance national development. It emphasises how important statistics are to the development of evidence-based strategies and policies for long-term growth and the welfare of society. Every year, a new area of statistics and its applications are highlighted as the theme of the day. National Statistics Day 2024, with its theme "Use of Data for Decision Making," highlights the transformative potential of data in shaping a better future. Through emphasising the relationship between statistics and sustainable development objectives, the celebration encourages data-driven strategies to successfully tackle socio-economic and environmental issues.

Volume 13 Issue 3 - 2024

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Received: June 10, 2024 | **Published:** June 28, 2024

Introduction

National Statistics Day in India, observed annually on June 29, honours the contributions of the eminent statistician Prof. Prasanta Chandra Mahalanobis. This day underscores the importance of statistics in policy-making, planning, and research. It offers a venue for showcasing developments in statistical research, methodology, and applications in a range of industries.

Every year, a new area of statistics and its applications are highlighted as the theme of the day. Usually, the theme is chosen to draw attention to the most recent developments, problems, and trends in statistical research, methodology, and applications. Through emphasising the relationship between statistics and sustainable development objectives, the celebration encourages data-driven strategies to successfully tackle socio-economic and environmental issues.

The theme for National Statistics Day 2024, "Use of Data for Decision Making," is especially relevant in today's data-driven world. It highlights how data can transform decision-making processes across various sectors, including governance, health, education, and business.

Historical context

Prof. Prasanta Chandra Mahalanobis, the architect of the Indian statistical system, was instrumental in establishing the Indian Statistical Institute and was a pioneer in applying statistical methods to solve real-world problems. His most notable contribution, the Mahalanobis Distance, is widely used in multivariate analysis. National Statistics Day commemorates his birth anniversary and serves to promote his legacy and the importance of statistics in development. In 2007, the Indian government declared June 29th to be National Statistics Day. To encourage statistical literacy and highlight recent advancements in the field, statistical organisations, academic institutions, and government agencies organise a variety of events on this day. Rao[1] emphasised how his contributions were significant when there was no research and learning happening in the field of statistics.

Major contributions

Prof. Mahalanobis presented the idea of the Mahalanobis distance, a crucial statistical metric that is applied in a number of domains, such as multivariate analysis, pattern recognition, and outlier detection. Established in 1931 by Mahalanobis in Kolkata, ISI has grown to be a world-renowned centre for statistical research and education. His contribution to the development of statistical instruments and techniques for economic evaluation and policy formation was especially significant in India's economic planning. With regard to large-scale surveys and censuses in particular, Mahalanobis made a substantial contribution to the development of sampling procedures. Through his work, data collection techniques became more accurate and efficient. Bhattacharjee and Maiti[2] included Mahalanobis' contributions in light of contemporary econometrics study.

Importance of data in decision making

Data-driven decision-making (DDDM) refers to the practice of basing decisions on data analysis and interpretation rather than intuition or personal experience alone. In the contemporary world, the availability of big data and advanced analytics tools has revolutionized how decisions are made. Here's how data influences various sectors:

1. **Governance**: Governments use data to formulate policies, allocate resources, and monitor progress. For instance, the use of census data helps in understanding demographic changes and planning for future needs in areas like healthcare, education, and infrastructure. The implementation of the Aadhaar system in India, a biometric identification program, showcases how data can streamline government services, reduce fraud, and ensure that benefits reach the intended beneficiaries.
2. **Healthcare**: In the healthcare sector, data analytics can improve patient outcomes, optimize operational efficiency, and reduce costs. For example, predictive analytics can help in early diagnosis of diseases, personalized treatment plans, and managing hospital resources effectively. During the COVID-19 pandemic, data played a crucial role in tracking the spread of the virus, planning vaccination drives, and allocating medical resources.
3. **Education**: Educational institutions leverage data to improve teaching methodologies, track student performance, and enhance administrative efficiency. Data on student learning patterns can help educators develop personalized learning experiences, thus improving educational outcomes. Lai and Schildkamp (2013) reviewed the importance of data and data-driven decision making in the field of education.

4. **Business**: In the corporate world, data-driven decision-making enhances strategic planning, market analysis, customer relationship management, and operational efficiency. Businesses use data to understand market trends, consumer behavior, and to drive innovations. For example, e-commerce companies use data analytics to recommend products, manage inventories, and optimize supply chains.[3]

Challenges in data utilization

Despite the potential benefits, several challenges impede the effective use of data for decision-making in India:

1. **Data Quality**: The accuracy and reliability of data are paramount. Poor data quality can lead to incorrect insights and misguided decisions. Ensuring data integrity through proper collection, validation, and cleaning processes is essential.
2. **Data Literacy**: There is a significant gap in data literacy among stakeholders. Training and education in data analytics and interpretation are crucial for enabling data-driven decision-making at all levels.
3. **Data Accessibility**: Access to relevant data is often restricted by bureaucratic processes, privacy concerns, and technical barriers. Creating open data platforms while ensuring data privacy and security can promote wider utilization of data.
4. **Infrastructure**: Adequate technological infrastructure is necessary to store, process, and analyze large volumes of data. Investment in advanced IT infrastructure and data centers is critical for harnessing the power of big data.

Government initiatives

The Indian government has undertaken several initiatives to promote the use of data for decision-making:

1. **Digital India**: This campaign aims to transform India into a digitally empowered society and knowledge economy. It promotes digital infrastructure, digital literacy, and the delivery of government services electronically.
2. **National data sharing and accessibility policy (NDSAP)**: This policy aims to facilitate the access to and sharing of government data. It encourages the use of data to improve transparency, accountability, and decision-making.
3. **Open Government Data (OGD) platform**: The OGD platform (data.gov.in) provides access to a wide range of datasets from various government departments. This promotes transparency and enables citizens, researchers, and businesses to use data for innovation and informed decision-making.

Case studies

Several successful case studies highlight the impact of data-driven decision-making:

1. **Aarogya Setu App**: During the COVID-19 pandemic, the Aarogya Setu mobile application was developed to track and monitor the spread of the virus. The app used data analytics to identify hotspots, track contacts, and provide real-time information to users, helping in the containment efforts.
2. **Pradhan Mantri Jan Dhan Yojana (PMJDY)**: This financial inclusion program used data to identify unbanked populations and ensure that financial services reached the underserved. The data-driven approach helped in opening millions of bank accounts and integrating marginalized sections into the formal financial system.
3. **Swachh Bharat Mission (SBM)**: The mission aimed at achieving universal sanitation coverage used data to track progress, identify gaps, and mobilize resources effectively. The use of geotagging and mobile applications for monitoring construction of toilets ensured transparency and accountability.

Future prospects

The future of data-driven decision-making in India looks promising, with advancements in technologies such as artificial intelligence (AI), machine learning (ML), and the Internet of Things (IoT). These technologies can further enhance the capabilities of data analytics, providing deeper insights and enabling more proactive decision-making. Marda[4] mentioned AI as the future of India in the field of policy development.

1. **AI and ML**: These technologies can automate data analysis, identify patterns, and make predictions with high accuracy. They can be used in various sectors, from predictive maintenance in manufacturing to personalized medicine in healthcare. AI tools are used to detect and respond to cyber attacks, which is critical for securing sensitive government data and infrastructure.
2. **IoT**: The proliferation of IoT devices generates vast amounts of data that can be used for real-time monitoring and decision-making. For instance, smart cities use IoT data for traffic management, energy conservation, and improving public safety.
3. **Block chain**: Block chain technology can ensure data integrity, security, and transparency. It can be used in applications like supply chain management, financial transactions, and public records.

Conclusion

National Statistics Day 2024, with its theme "Use of Data for Decision Making," highlights the transformative potential of data in shaping a better future. By leveraging data, India can make informed decisions that drive progress, enhance governance, and improve the quality of life for its citizens. However, to fully realize the benefits of data-driven decision-making, it is essential to address challenges related to data quality, literacy, accessibility, and infrastructure. As we celebrate the contributions of Prof. Prasanta Chandra Mahalanobis, let us also commit to fostering a data-driven culture that empowers individuals and organizations to make informed and impactful decisions.

Acknowledgments

None.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Citation: Lishamol T, Anagha K. Indian National Statistics Day 2024: Celebrating the power of data for decision making. *Biom Biostat Int J.* 2024;13(3):72–74. DOI: 10.15406/bbij.2024.13.00417

Funding

None.

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Citation: Lishamol T, Anagha K. Indian National Statistics Day 2024: Celebrating the power of data for decision making. *Biom Biostat Int J.* 2024;13(3):72–74. DOI: 10.15406/bbij.2024.13.00417