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A Discussion on E-Governance Initiatives for Disabled Citizens

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Abstract: ***This paper seeks to explore the current challenges before the persons with disabilities and how those challenges could be overcome through better understanding of their needs. Accessible digital technologies are great levellers and they ensure that the basic services are uniformly accessible across primary domains such as education, healthcare, housing, utilities etc. The paper begins with a brief introduction to the benefits of ICT for disabled citizens and provides a snapshot of select E-governance implementations in India and abroad. The paper also discusses various kinds of disabilities and endeavours to suggest some of the common ICT based tools that could be used to address the needs of the disabled.***
Keyword: E-governance, Disability, Inclusiveness, ICT, Impairment, Handicap

I. INTRODUCTION

ICT has emerged as one of the primary propellers of economic growth for any country. The developments in ICT have heralded a new order of things where almost every facet of our lives is closely linked with computing devices in some way. Governments across the globe are harnessing the emerging technologies to provide better governance to its citizens. The information and communication technologies are providing access to government services even to the remotest parts which were hitherto untouched. Persons with disabilities have been by and large marginalized from the bigger set of benefits available through the developments in new age technologies. ICT has facilitated breaking of barriers and providing uniform accessibility to all stakeholders. The United Nations Convention on the Rights of Persons with Disabilities (CRPD), which was adopted in 2006, has very clearly stated its aim to "promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity. The disabled have been excluded and marginalised from the mainstream for a long time. Technology has played a highly enabling role in facilitating access of government services by disabled citizens. New technologies such as voice recognition, face recognition, magnification devices, screen reading software, speech devices are gaining popularity and encouraging reintegration. An increasing number of government agencies, manufacturers and other stakeholders are realising that accessibility should not be addressed as an add-on feature in devices – rather it should be embedded by default to promote the concept of inclusiveness. The aim of this study is to identify the primary challenges in availing ICT based services by the disabled citizens, and how those difficulties could be overcome. It is important to state here that a lot of developments have been made in mainstream, every day ICT through mobile phones and desktops that facilitate better mechanism of communication for disabled people. Such functionalities include text-to-speech, voice recognition, touch and gesture input, screen magnification, ergonomic designs etc. through state of the art embedded technologies. As such, a person who is visually impaired could use the text-to-speech functionality of the computing device to listen to the contents of the website, while someone with hearing impairment could use text, visuals and SMS to communicate across. Samant, Matter, and Harniss (2013) have empirically shown that the success of new age technologies in providing suitable benefits to the disabled stakeholders is severally influenced by their knowledge and awareness of the ICT solutions available, laws and policies, and their capacity to support accessible ICT services.

II. REVIEW OF LITERATURE

ICT is a highly pervasive and cross-functional tool that has ramifications in wide range of activities. Few research papers that have dealt with e-governance and disability have been briefly discussed below.

A. Deepti Samant Raja (2016) in her paperprovides a holistic study of the latest facilities and ICT enabled tools being provided in general public services and how a level playing field in various life domains such as education, health, employment etc. are being created for disabled citizens. The paper puts forward the primary difficulties in taking forward an inclusive ICT policy and suggests various cost-effective measures through which governments could incorporate latest developments in the field.

B. Prashant Srivastava and Pradeep Kumar (2015) in their paper have discussed about the causes of disability, factors affecting disability, constitutional framework in India, acts relating to disability, overview of the programmes and concessions for the disabled, measurement of disability, hurdles in accessing benefits and services for the disabled. The paper posits that social rehabilitation is more important than medical one and the disabled must be provided the benefits of e-governance through an inclusive model that takes into account their special needs and concerns. The paper feels that better affordability could be provided through legislations so that more and more disabled people could be brought to the mainstream.

C. Gohin. B and Vinod, V (2015) in their paper focus on accessibility and usability of e-governance websites taking into account the special needs and requirements of the disabled people. Through this paper the authors have tried to explore the accessibility requirements of the disabled people and the issues that need to be addressed by the Indian websites in fulfilling the special needs of disabled people. The findings of this paper highlight the various difficulties in fulfilling the needs of the disabled people.

D. In their paper, Kažemikaitiene, E. & Bilevičiene, T. (2008) have opined that the disabled citizens are perhaps the segment that would most benefit from e-governance implementations but somehow have the lowest rate in use. The authors have undertaken research on the e-governance initiatives in the Lithuanian state and it presents a broad analysis of the government websites and the extent to which they fulfil the needs of the disabled people. The authors have vividly discussed the peculiarities of information society development and establishment of electronic government in the European Union and Lithuania along with the problems of disabled persons and their solution in information society. The Lithuanian websites are not adequately adapted to the requirements of the disabled citizens and only 28% of the analysed websites have link “adapted for the disabled.”

E. The United Nations E-Government Survey (2018) published by Department of Economic Affairs, United Nations, New York talks about “digital divide” and how new divides have emerged leaving aside the old divides that involved only lack of access to internet and infrastructure. The new divides include several factors such as ease of access, affordability, age of users, bandwidth, content, disability, gender, education, location, mobile, speed etc. The discussion has moved from single digital divide to multiple digital divides. Considering the multitude of digital divides what has become more important is “useful usage” as a key difference maker in ensuring people usefully utilise the services offered by e-governance. The report opines that special attention needs to be paid to the vulnerable groups as there is a strong correlation between digital exclusion and social exclusion. Disabled persons are as vulnerable to online services as they are to offline services. Government must increase awareness so as to increase online usage.

III. RESEARCH GAP

While a lot of research has been done on the impact of e-governance for common citizens in cities, towns, villages etc. not much research has been done to consider its impact on disabled citizens. This research paper intends to understand the barriers that disabled citizens often face in accessing citizen centred services. Especially in a country like India that has a huge population of disabled crowd across ages and genders, a better understanding of the new disabled friendly technologies and their applications would only help the state and the central governments frame more appropriate and inclusive policies concerning public welfare. While some countries have done research on this subject there are not many research papers from India that have focused solely on the Indian perspectives.

IV. OBJECTIVES

This paper would provide suitable insights to the interest groups and policy makers in devising appropriate policies for the benefit of people with various kinds of disabilities. The primary purpose is to ensure that there is greater awareness in understanding the needs of the disabled citizens and provide ways to fulfil those needs. There are several hardware and software tools used by more developed societies today in providing equitable access to the haves and have nots. This paper would provide the practitioners and service provides some essential knowledge on the prevailing best practices.

V. RESEARCH METHODOLOGY

The study is based on secondary data. The data for the present study have been taken from published reports, documents, handbooks, articles, journals and various websites. The method used is analytical and descriptive.

VI. WHAT IS DISABILITY?

The Merriam Webster dictionary defines disability as a physical, mental, cognitive, or developmental condition that impairs, interferes with, or limits a person's ability to engage in certain tasks or actions or participate in typical daily activities and interactions. Rights of Persons with Disabilities Act, 2016 replaces the Persons with Disabilities (Equal Opportunities, Protection of

Rights and Full Participation) Act, 1995 and subsequently the number of disabilities covered has increased from 7 to 21. The new Act that came into force in December 2016 fulfils the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory. The 21 disabilities are presented in **Exhibit 1** given below. Further, the Act defines "benchmark disabilities" as such wherein affected persons have at least 40 per cent of the disabilities.

While "disability" is a common generic term for representing any kind of physical, mental or other inability, there are two more terms "impairment" and "handicap" that are used interchangeably. The World Health Organization (1980) in The International Classification of Impairments, Disabilities, and Handicaps provides the following definitions:

1) *Impairment:* Any loss or abnormality of psychological, physiological, or anatomical structure or function.
2) *Disability:* Any restriction or lack, resulting from impairment, of ability to perform any activity in the manner or within the range considered normal for a human being.
3) *Handicap:* A disadvantage for a given individual, resulting from an impairment or disability, that prevents the fulfilment of a role that is normal depending on age, sex, social, and cultural factors for that individual.

VII. ICT CHALLENGES BEFORE DISABLED CITIZENS

Around 15% of the global population is estimated to live with some or other kind of disability. Around 80% of these people live in developing countries. The United Nations Convention on the Rights of Persons with Disabilities (in force in May 2008) was the first international treaty to clearly outline the rights of people with disabilities and clearly specify a code of implementation. The primary objective of the convention is to support, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by persons with disabilities. The Convention is unique in a way that it shifts the attention away from the mental and charity model to a more inclusive understanding of disabilities wherein the disabled are not considered as beneficiaries but as partners in progress. While there are different categories of disabilities, even their taxonomies too are different.

As per one taxonomy there are three kinds of barriers – social, economic and physical. Each of these categories again has two sub categories – internal and external. External social barriers occur when society itself fails in providing adequate support to the disabled citizens while internal social barrier occurs when a disabled person harbours self-limiting beliefs and personal inhibitions as a disabled. External economic barriers happen when the society is unable to provide remunerative and purposeful employment to the disabled citizen while internal economic barriers occur when the disabled citizen are themselves unable to meet their needs. External physical barriers are more commonly seen everywhere – where a predominantly able society has created an infrastructure, systems and environments that are inaccessible and unfriendly to disabled citizens. The internal physical barriers could be related to vision, hearing, speech, mobility, cognition, and psychosocial issues. There is another taxonomy that classifies barriers into six categories. Please refer Exhibit 2. The general inaccessibility of the traditional "brick and mortar" and "pen and paper" based infrastructure in educational, employment, information, and other social environments is one of the primary reasons behind the marginalisation of persons with disabilities.

VIII. SELECTED E-GOVERNANCE FACILITIES IN INDIA FOR DISABLED CITIZENS

The central and the various state governments have started to realise the importance of providing more inclusive services to the disabled and to provide ways to address their unique needs. Several departments have taken initiatives in building a more inclusive architecture that fulfil the basic needs and requirements of the disabled. Here, we are providing brief details of a few of them.

1) The Government of India has issued Guidelines for Government Websites and Guidelines for Development of Applications (GudApps). The Guidelines for Government Websites provide suitable resources in regard to Validation Tools, Accessibility, Mobile Friendliness, Assistive Technologies and Screen Reader Access. All these have very clear guidelines in regard to their suitability for people having various kinds of disabilities.
2) The Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment, Govt of India initiated the Unique Disability ID (UDID) to provide a comprehensive, single window, integrated facility to the disabled citizens to avail various eligible benefits from the government and other bodies. It has facilitated creation of national database of disabled citizens. This will bring greater transparency, efficiency and operational effectiveness in proving the desired benefits to the disabled citizens. The UDID card offers multiple benefits to the users. First, a unique user need not have to carry multiple documents as the UDID shall have all the required details. Second, it will be the only document to permit the beneficiary to avail various kinds of services and facilities from the government. And finally, it will be useful in tracking the efficiency and effectiveness in delivery of benefits and services to the beneficiaries at all levels – village, block, district, state and national level.

3) The Department for Empowerment of Differently Abled and Senior Citizens, Government of Karnataka provides various kinds of electronic services for the benefit of the target groups. This includes scholarships for disabled citizens, incentives for the disabled citizens with gifted talent, higher education fee reimbursement, Marriage Promotion Funding Programme, Medical Fund Relief Scheme.
4) The Pensioners Portal of the Government of India is a one stop portal that provides all kinds of benefits to the pensioners at one place. It is especially helpful for such old people who are physically unable to avail the services.
5) The Social Justice and Disabled Welfare Department of Government of Madhya Pradesh provides education, training, employment, rehabilitation programs, scholarships, educational incentives for orthopaedically handicapped, visually impaired, hearing impaired and mentally retarded persons.
6) The Rights of Persons with Disabilities Act, 2016 was enacted in December 2016. It replaced the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. The Act aims to protect various kinds of rights of disabled citizens of the country and imposes penalties in case of violation of the various provisions.
7) The Government of India's Department of Disability Affairs launched the Accessible India Campaign (AIC) (Sugamya Bharat Abhiyan). The campaign endeavours to increase accessibility in various key areas such as infrastructure, transportation etc. It also rates various public and private companies in their disabled friendliness through a disability index. Under the Accessible India Campaign efforts are being made to make 50% of the central and stage government websites accessible. Even before the launch of this campaign, the Government of India released the Guideline for Indian Government Websites (GIGW) in 2009. GIGW mandated accessibility of government websites as per the Web Content Accessibility Guideline 2.0, published by the World Wide Web Consortium (W3C).

IX. SELECTED GLOBAL PRACTICES FOR DISABLED PERSONS

1) *UK and Ireland:* The TATE Project (Through Assistive Technology to Employment) is a research and development partnership project to support people with learning disabilities to be more independent and employable. The TAFE project brings assistive technology and telecare together for people with a learning disability. The project, by using technology in an innovative way, is supporting people to have more opportunities, independence, social coherence and employability.
2) *USA:* The Americans with Disabilities Act (ADA) was enacted in 1990. It aims to prevent inequity and encourage equal opportunity for persons with disabilities in various facets of their daily life. The Twenty-First Century Communications and Video Accessibility Act of 2010 was enacted to provide equal access to new-age technologies to all citizens. The Act is divided into two broad titles - with the first aiming to make products and services using broadband(such as smartphones) fully accessible to people with disabilities while the second aiming to make televisions and video programming more accessible.
3) *Japan:* Japan has been very creative and empathetic in understanding the needs of the disabled people. For instance, ticketing vending machines of low heights have been specifically installed for wheelchair users. They also have tactile surfaces (in Japanese) and audio help for people with vision impairment. White boards are also made available at staff offices so the mute persons could communicate.
4) *South Africa:* Lwazi, is a progressive project of the Department of Telecommunications and Postal Services of South Africa that has been helping women who have been victims of gender based violence learn employment-oriented ICT skills and go entrepreneurial.

X. CONCLUSIONS

A progressive society must have in place appropriate mechanisms to ensure inclusivity of the disadvantaged groups. Policymakers, technology companies, educational institutions, banks, public utilities and almost every important business unit must ensure that disabled are not left out in the growth paradigm that impacts normal citizens. The Government of India intends to provide a single-window access to its various services through the Unified Mobile Application for New Age Governance (UMANG) app. While its usefulness seems obvious for general citizens, it remains to be seen how far it impacts the disabled. Does it really fulfil the accessibility needs of various categories and kinds of disabled people? The same applies to almost all government offices, departments and public utilities. While the Accessible India Campaign carries immense hope that it would serve the purpose of bringing more disabled citizens in the mainstream and help them avail citizen services like normal citizens, it remains a long way to achieve the degree of inclusiveness that we witness in some of the more advanced and progressive nations of the world. An achievement of that order would require massive efforts and understanding from all important stakeholders, including the government and the common citizens.

Table 1. 21 Kinds of Disabilities

Blindness	Mental Illness	Speech and Language disability
Low-vision	Autism Spectrum Disorder	Thalassemia
Leprosy Cured persons	Cerebral Palsy	Hemophilia
Hearing Impairment (deaf and hard of hearing)	Muscular Dystrophy	Sickle Cell disease
Locomotor Disability	Chronic Neurological conditions	Multiple Disabilities including deafblindness
Dwarfism	Specific Learning Disabilities	Acid Attack victim
Intellectual Disability	Multiple Sclerosis	Parkinson's disease

Source: Different Types of Disabilities: List of 21 Disabilities, https://wecapable.com/types-of-disabilities-list/

Table 2. 6 General Types of Disabilities

Disabilities	Subcategories / Description
Physical Disabilities	❑ Can be fluctuating or intermittent, chronic, progressive or stable, visible or invisible ❑ Progressive: get worse over time but can fluctuate. ❑ Non-Progressive: remain stable.
Visual Disabilities	❑ "Legally Blind" describes an individual who has 10% or less of normal vision. ❑ Only 10% of people with a visual disability are actually totally blind. The other 90% are described as having a "Visual Impairment." ❑ Common causes of vision loss include: Cataracts (cloudy vision – treatable), Diabetes (progressive blindness), Glaucoma (loss of peripheral vision), Macular Degeneration (blurred central vision) ❑ Retinal Detachment (loss of vision), Retinitis Pigmentosa (progressive blindness)
Hearing Disabilities	❑ "Deaf" describes an individual who has severe to profound hearing loss. ❑ "Deafened" describes an individual who has acquired a hearing loss in adulthood. ❑ "Deaf Blind" describes an individual who has both a sight and hearing loss. ❑ "Hard of Hearing" describes an individual who uses their residual hearing and speech to communicate.
Mental Health Disabilities	They are generally classified into six categories: ❑ Schizophrenia ❑ Mood Disorders (Depression and Manic Depression) ❑ Anxiety Disorders ❑ Eating Disorders ❑ Personality Disorders – There are many different personality disorders. People with these disorders usually have a hard time getting along with other people. They are the most difficult disorders to treat. ❑ Organic Brain Disorders – These disorders affect about 1% of people. They are the result of physical disease or injury to the brain (i.e., Alzheimer's, Stroke, Dementia).
Intellectual Disabilities	❑ Characterized by intellectual development and capacity that is significantly below average. ❑ Involves a permanent limitation in a person's ability to learn.
Learning Disabilities	❑ A learning disability is essentially a specific and persistent disorder of a person's central nervous system affecting the learning process. ❑ Having a learning disability does not mean a person is incapable of learning; rather that they learn in a different way. ❑ Many people with a learning disability develop strategies to compensate for or to circumvent their difficulties.

Source: Robichaud, T., 6 General Types of Disabilities, https://changingpaces.com/6-general-types-of-disabilities/

Table 3
Various Types of Assistive Devices

Cognitive devices	Lists, diaries, calendars, schedules, electronic devices, e.g. mobile phones, pagers, personal organizers
Communication Devices	communication boards with pictures, symbols or letters of the alphabet, request cards, electronic speech output devices, computers with specialized equipment and programmes.
Computer software and hardware	Voice recognition, screen readers, etc.
Daily living devices	Toilet seats and frames, commodes, cutlery and cups, shower seats etc.
Hearing devices	hearing aids, headphones for listening to the television amplified telephones, TTY/TTD (telecommunication devices), visual systems to provide cues, e.g. a light when the doorbell is ringing.
Mobility aids	Wheelchairs, Crutches, walking sticks / frames / walkers wheelchairs, walkers, canes, prosthetic devices etc.
Physical modifications in the built environment,	including ramps, grab bars, and wider doorways to enable access to buildings, businesses, and workplaces
Positioning devices	Wedges, chairs, e.g. corner chairs, special seats, standing frames.
Prosthetics, orthotics and orthopaedic shoes	prostheses, e.g. artificial legs or hands orthoses, e.g. spinal braces, hand/leg splints or callipers orthopaedic shoes.
Specialised devices	Handles, grips and other devices that assist in daily activities such as switching the light on, opening the door etc.
Tools	automatic page turners, book holders, and adapted pencil grips to help learners with disabilities participate in educational activities
Vision devices	large print books, magnifiers, eyeglasses/spectacles white canes, braille systems for reading and writing, audio devices, e.g. radios, talking books, mobile phones, screen readers for computers, e.g. JAWS (Job Access with Speech) is a screen reader programme.

Source: McFadden, C., 7 of the Best Tech for the Impaired, https://interestingengineering.com/7-of-the-best-tech-for-the-impaired, 29 Dec 2019

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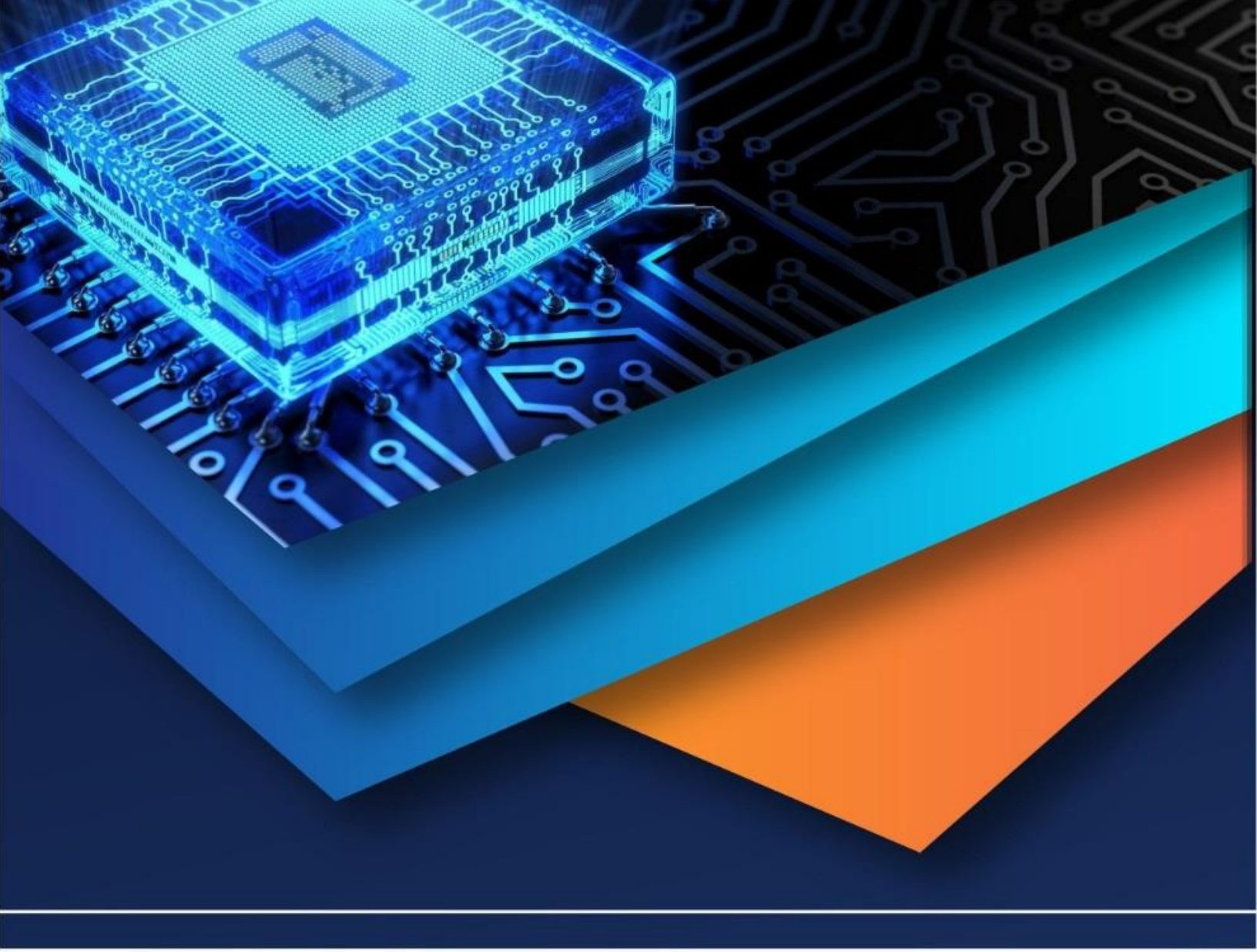

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