A STUDY OF SEAMLESS END-TO-END SERVICE DELIVERY
BY NEW DELHI MUNICIPAL CORPORATION (NDMC)

A Dissertation Submitted to the Panjab University, Chandigarh for the award of Degree of Executive Masters in Public Administration and Public Policy, in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration (2023-24)

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<u>SELF DECLARATION CERTIFICATE</u>

       I, the undersigned hereby declare that the dissertation titled 'The study of seamless end-to-end service delivery by New Delhi Municipal Corporation (NDMC)', submitted by me for award of the Degree of Executive Masters in Public Administration is original and this work or part thereof has not been submitted for the award of any degree or diploma either in this or any other University. All the sources I have accessed or quoted have been indicated or acknowledged by means of references.

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<u>CERTIFICATE</u>

I have pleasure to certify that Air Commodore Sandeep Singh has pursued his research work and prepared the present dissertation titles 'The study of seamless end-to-end service delivery by New Delhi Municipal Corporation (NDMC)' under my guidance and supervision. The same is the result of research done by him and to the best of my knowledge; no part of the same has been part of any monograph, dissertation or book earlier. This is being submitted to the Panjab University, Chandigarh, for the purpose of Executive Masters in Public Administration and Public Policy in partial fulfilment of the requirement for the Advanced Professional Programme in Public Administration (APPPA) in Indian Institute of Public Administration (IIPA), New Delhi.

I recommend that the dissertation of Air Commodore Sandeep Singh is worthy of consideration for the award of Executive Master's degree of the Punjab University, Chandigarh.

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<u>ACKNOWLEDGMENTS</u>

TABLE OF CONTENTS

ACRONYMS/ ABBREVIATIONS

Acronyms/ Abbreviations	Full Form
APP	Application
AMI	Advanced Metering Infrastructure
API	Application Programming Interface
AI/ML	Artificial Intelligence/ Machine Learning
CSMS	Central Service Management System
CRM	Crew Resource Management/ Citizen Relationship Module
CPGRAMS	Centralised Public Grievance Redress and Monitoring System
DDDM	Data Driven Decision Making
DEG	Digital Era Governance
GDP	Gross Domestic Product
GIS	Global Information System
GST	Goods and Service Tax
iGOT	Government Online Training
IR	Industry Revolution
IT	Information Technology
IoT	Internet of Things
ICT	Information Communication Technology
NASSCOM	National Association of Software and Service Companies
NDMC	New Delhi Municipal Corporation
NLP	Natural language processing
NPM	New Public Management
NRI	Non Resident Indian
MP	Member of Parliament

vii

Acronyms/ Abbreviations	Full Form
OECD	Organization for Economic Cooperation and Development
PM	Prime Minister
PHI	Protected Health Information
PII	Personally Identifiable Information
SDGs	Sustainable Development Goals
SLA	Service Level Agreement
UN	United Nations
UDAY	Ujwal DISCOM Assurance Yojana
VBD	Vector Borne Disease
URL	Uniform Resource Locator
VAT	Value Added Tax

LIST OF TABLES AND CHARTS

LIST OF APPENDICES

ABSTRACT

In the digital age, e-governance initiatives have profoundly transformed the way governments interact with their citizens. The NDMC '311 App', public service request platform, represents a prime example of how technology can revolutionize Municipal service delivery. This comprehensive study examines the end-to-end facilitation of public services through a 311 App, analysing its implications for service efficiency, citizen empowerment, and its embodiment of good governance principles.

Traditionally, accessing Municipal services often entailed navigating bureaucratic hurdles, facing long wait times, and experiencing a lack of transparency. The 311 App addresses these challenges by providing a centralized, user-friendly platform for citizens to report issues, request services, and track their progress. This study highlights the app's ability to optimize municipal operations by consolidating service requests, streamlining workflows, and enabling data-driven resource allocation (Bertot et al., 2010; Meijer & Rodríguez Bolívar, 2016). Real-world case studies from cities such as New York and Boston demonstrate how the 311 App leads to faster response times for issues like pothole repairs, sanitation complaints, and infrastructure maintenance (Sandoval-Almazán & Gil-Garcia, 2012).

Beyond operational efficiency, the 311 App functions as a powerful tool for fostering democratic participation and citizen-centric governance. The app empowers citizens by simplifying the process of providing feedback and holding municipal authorities accountable (Ganapati & Reddick, 2014; Nam, 2012). Citizens can directly report issues affecting their communities, monitor the resolution process, and even contribute to collaborative problem-solving efforts. This study investigates how the app's transparency features promote accountability and responsiveness, key tenets of good governance (Singh & Jain, 2016; Wong & Welch, 2004).

This research studies the NDMC's 311 App's potential to address challenges specific to urban service delivery. It explores how the app can

contribute to initiatives like the Smart Cities Mission, where technology plays a crucial role in improving civic infrastructure and services (Kumar & Panneerselvam, 2018). The study would find out and highlight how NDMC in a metropolitan city has successfully implemented 311 apps, leading to enhanced service delivery and citizen satisfaction. Moreover, the app's integration with grievance redressal mechanisms and public outreach initiatives can help bridge the gap between citizens and local governments.

The ability to collect and analyse data generated through the 311 App offers valuable insights for municipalities. By visualizing service request patterns, identifying recurring problems, and measuring performance metrics, municipal authorities can make informed decisions to improve service delivery. Data-driven insights can also lead to more targeted public awareness campaigns and proactive solutions that address the root causes of civic issues.

However, the success of the NDMC's 311 App is contingent upon widespread adoption and accessibility. The study addresses the potential digital divide by proposing strategies for inclusive design and outreach initiatives to reach marginalized communities. Emphasis is placed on providing multilingual support, offline access options and training programs to ensure that all citizens, regardless of their technological literacy, can benefit from the app's offerings.

In conclusion, the NDMC's 311 App embodies a powerful model for e-governance within the municipal context. By streamlining service requests, promoting transparency, fostering citizen participation, and upholding democratic principles, the app represents a significant step forward in providing efficient, responsive, and inclusive public services. This study lays the groundwork for further investigation into factors influencing citizen adoption, strategies to maximize the app's impact, and best practices for leveraging the app's data for long-term improvement of municipal services.

CHAPTER I

INTRODUCTION

"In this decade of 'Amrit Kaal', we will give priority to next generation reforms...... We will ensure that all the facilities like service delivery should reach citizens up to the last mile; It should reach the last person seamlessly, without hesitation or any kind of difficulty. For the overall development of the country unnecessary interference by the government and government processes in the lives of the people has to be ended."

"E-governance is easy governance, effective governance, and also economic governance. E-governance paves the way for good governance."

Honorable Prime Minister Narendra Modi

"Prime Minister Shri Narendra Modi has given a digital outlook to the governance for ease of living for common citizens of the country"

Union Minister Dr. Jitendra Singh

General

Indian economy will reach GDP size of US$26 trillion (in market exchange terms) by 2047, the 100th year of the country's independence. The per capita income is expected to increase to US$15,000, putting the country among the ranks of developed economies. The report, India@100: *Realizing the potential of a US$26 trillion economy*, was launched by Sri Ashwini Vaishnaw, Railway and IT Minister, Government of India on the side-lines of the World Economic Forum at Davos, Switzerland.[1] The PM has given a vision mission is to make

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[1] https://www.ey.com/en_in/news/2023/01/ey-projects-india-to-become-a-us-dollor-26-trillion-economy-by-2047-with-a-six-fold-increase-in-per-capita-income-to-us-dollor-15000 accessed on 11 Sep 23

India the third largest economy in the World. With this as national strategic driver, an overreaching objective of 'Minimum Government Maximum Governance' has been adopted for Governance. Some goals that have been identified that will make this vision a reality are: -

The government will carry out its core functions while public service delivery will be carried out in collaboration with private sector and civil society.

The role of digital technologies will increase to achieve citizen first approach.

Whole-of-the Government approach shall be implemented to deliver governance at grass root level.

Equitable development of all regions will be ensured, and inclusive development will be promoted.

Government as well judicial system will be citizen centric.

To facilitate citizens and reduce their burden, databases in different government departments shall be interoperable and linked.

The Government shall aim to hire and attract best talent through fixed term engagement on competitive remuneration for domain specific professionals.

The vision includes putting citizen first and bringing the citizens and government closer. To achieve this, the government has specifically highlighted eight focus areas, as enumerated below: -

Ensuring Public Service Delivery. In order to enhance public service delivery three themes have been identified namely technology enabled service delivery with government as platform, delivery assessment &

multilingual grievance redressal and benchmarking governance. For technology enabled service, all processes will be made digital, multilingual and voice enabled for ease of access and availability from anywhere. Additionally, for improved public service delivery auto approval of service requests using metrics for service evaluation is to be achieved by 2047. To assess effectiveness of e-delivery a national e-service delivery assessment will be conducted. Also, multilingual CPGRAMS portal will strengthen grievance redressal process. Several indices to benchmark Governance performance at State/UT/district level such as Good Governance Index, grievance redressal index etc. can be leveraged. The aim is to engage citizens with the public service. Big Data Analytics with AI/ML and NLP algorithms shall be utilized for creating such systems to enhance citizen experience and with Blockchain for secure and trustworthy systems.

Engaging with Citizens. To move towards citizen centric governance, public communication system is been promoted. The aim of these is to ensure that language does not become barrier for which universal access to communication in different formats and languages will be ensured. In addition, a national digital Multi-lingual Platform for outreach and information dissemination will also be setup. Apart from this all Indian Government websites will be Indian and UN language compliant. NLP based algorithms shall be utilised to break the barrier of language while engaging with citizens.

Civil Services @ 2047. Civil services are at centre of all government activities and play a critical role in service delivery, program implementation and improving ease of living and doing business. The Civil services are to be reformed into broad groups, namely Structure, Adaptive Governance, Process and Capacity Building. For adaptive governance a shift towards digital transformation in governance to enable data-based decision making will be carried out through AI/ML and Big Data Analytics. And also, for capacity building, Mission Karamyogi Programme will be delivered through setting up Integrated

Government Online Training (iGOT) Platform, which shall enable world class learning available to civil service officials in digital form.

Zero Tolerance to Corruption.   There will be emphasis on curbing corruption through structural, process and institutional redesign. Institutional redesign shall be carried out by Digital Transformation of processes, so as to bring in more transparency.

Electoral Reforms.   The electoral reforms would focus on leveraging technology to minimize disruption and smoothen the voting process. Also, e-voting facility would be introduced for NRI as well as within India to achieve maximum turnout for electorates.

Speedy Justice for All.   In order to meet the aspirations for speedy justice of citizens, reforms are required with on digital infrastructure so as to make the judicial system completely digital and ensuring access of judicial documents to citizens. Also, to overcome the pending cases, creation of unified judicial data grid with other bodies like police, forensic, labs are on the common grid. Also, digital platforms for legal consultation foe stake holders shall be established.

Becoming Globally Competitive.   In order to become globally competitive high levels of productivity have to be achieved in the country and also need to have the capability to utilize existing market opportunities to endure and expand employment and real income growth in the long term. This can be achieved through technical enablement of Industry Revolution (IR) 4.0 and followed up with emerging paradigm of Industrial Revolution 5.0.

Indian Abroad. In order to improve position of Indian abroad, mainstreaming Indian diaspora to National Development Agenda through creation of sectoral consultative policy hubs. Also explore more treaties with OECD countries to allow for free mobility and migration of Indian citizens. Towards this goal, an integrated e-Migrate Platform

for overseas jobs, orientation and grievance redressal for migrants will be created.

In the modern era, the integration of technology in public administration has become imperative for efficient and citizen-centric service delivery. New Delhi Municipal Corporation (NDMC) has been recognized and awarded for its pioneering work in achieving seamless end-to-end service delivery without human intervention by the PM in 2021. This remarkable feat demonstrates NDMC's commitment to leveraging technology to improve the lives of its residents.

This research proposal seeks to delve deeper into this award-winning theme, with a specific focus on two vital areas: electricity services and information technology infrastructure. By studying these areas, we aim to understand the transformative potential of automation and assess its implications for public administration excellence.

Statement of the Problem

In an increasingly digitalized world, the deployment of e-governance through use of IT and digital means like mobile applications for the efficient and user-friendly delivery of public services has become a ubiquitous trend. As governments and organizations invest substantial resources in developing and implementing these digital platforms and service delivery apps, there is a critical need to comprehensively refine the methodology applied for enhancing service accessibility, quality and overall public satisfaction. New Delhi Municipal Corporation (NDMC) has through medium of 311 app and digital delivery of services in NDMC area. There would be takeaways for replication in other districts as also gaps in our understanding of their true effectiveness and the factors that influence their success.

This dissertation aims to address this knowledge gap by conducting a study of seamless end-to-end service delivery of services through 311 app and digital delivery of services by NDMC. The primary objective is to examine the

extent to which the e-initiatives enhanced the accessibility and efficiency of public services like electricity and property services, while also considering the potential implications on user satisfaction and the overall user experience. Furthermore, this study seeks to identify the key determinants of app success or failure, including technological, organizational, and societal in order to provide actionable recommendations for policymakers and service providers.

<u>Research Objectives</u>.

The primary objectives of this research are as follows:

To study the NDMC's Award-Winning Theme: Examine the key elements of NDMC's theme for seamless end-to-end service delivery without human intervention. Understand its inception, objectives, and implementation strategies.

To assess how the scheme has made a difference to the Electricity Services offered through the e-governance using 311 app and digital delivery of services: Assess how automation has transformed the provision of electricity services in New Delhi, focusing on aspects such as efficiency, reliability, and customer satisfaction.

To assess how the scheme has made a difference to the Property services offered through e-governance using 311 app: Examine how NDMC has automated and digitised services related to property and its effect on the overall citizen satisfaction levels and improvement quality of services and public administration efficiency.

To Identify Challenges and give recommendations: Analyse the challenges faced during the implementation of the automated system and identify lessons that can be applied to future e-governance projects. Based on the research findings, provide recommendations for NDMC and other municipal corporations looking to enhance their service delivery through automation.

Research Strategy and Research Design

The research strategy is primarily qualitative with some application of quantitative. A pre-tested questionnaire would be used to collect responses of technology experts / thought-leaders / academics / policy makers associated with the realm. The research is therefore exploratory and descriptive in nature. Structured / semi –structured observation and interviews will also be used.

Rationale/ Justification

The rationale for this research lies in the growing importance of e-governance and the need to examine it's the comprehensively difference it made in delivery of public services. This is of significance especially in a country where due to a large population where personalised service would be a challenge, hence innovative delivery digital delivery at the consumers home is facilitated though an easy interfaced apps/digital means. As municipalities worldwide are increasingly adopting automated processes, NDMC's success story provides an excellent case study to analyse the benefits and challenges of such initiatives.

Research Questions.

This research will address the following two research questions:

Research Question 1: Electricity Services

How has the implementation of seamless end-to-end service delivery without human intervention altered the quality and efficiency of electricity services provided by NDMC?

Sub-questions:

What were the key automation technologies and processes adopted by NDMC for electricity services?

How has the reliability of electricity services improved since the implementation of the automated system?

What is the level of customer satisfaction with NDMC's automated electricity services?

Research Question 2: Property Services

How has the automation of property services by NDMC through the integration of information technology infrastructure contributed in achieving customer satisfaction, participation and delivered effective administration with seamless end-to-end service delivery?

Sub-questions:

What role has information technology played in streamlining NDMC's property service delivery processes?

How has the integration of information technology improved processing property related services timelines and data management within NDMC?

What is level of customer satisfaction and what have been challenges and benefits are associated with the adoption of information technology in property related services, as evidenced by NDMC's experience?

Research Question 2: Strategies/Policy Changes for refinement of Service Delivery

What are the strategies/policy changes required to ensure the process is further refined towards enhancing the service delivery to citizens effectively?

Scope of the Study

The scope of the study is limited assessing the difference made to service delivery in the specific sectors of electricity and property services delivered seamlessly through the e-governance and digital platform like 311app and to bring out the takeaways for innovative implementation of e-governance and institutional voids if any.

Methodology

This research will adopt a mixed-methods approach, using data collection through surveys and data analysis from various concerned organisations. The following research methods will be utilized: -

Documentary Analysis: Review of NDMC's reports, policy documents, and publications related to the theme of seamless end-to-end service delivery without human intervention.

Surveys: Conduct surveys among NDMC electricity service users and property services user stakeholders to gather quantitative data on service quality, reliability, and satisfaction levels.

Interviews: In-depth interviews with NDMC officials, technology experts/thought leaders/academics/ employees, users, policy makers

(Champions of Change) and technology vendors to gain insights into the implementation process, challenges faced, and lessons learned.

Data Sources

Primary data shall be collected through survey by questionnaire/interviews of the stake holders viz technology experts / thought-leaders / academics / policy makers (Champions of change) / operators / users associated with the scheme

Secondary data (2016-2023) shall be collected through content analysis & literature review of articles in referenced academic journals, case studies of similar schemes in other cities, online reports and policy documents by credible sources

The study would involve an in-depth study and analysis of Research Papers and articles on the issue which have been published in various renowned journals as well as available on internet for better understanding of the subject.

Chapterisation

The Chapterisation scheme for the research report will be as follows: -

Chapter 1: Introduction. The chapter will give an overview of the subject bringing out all the important aspects. It will also cover the Statement of the Problem, Rationale or Justification for the study Research Design including Research Objectives and Research Questions.

Chapter 2: Review of Literature. The chapter will elaborate on the learnings picked up from review of literature.

Chapter 3: Theoretical Framework. The theoretical aspects of which would help in explaining the digital models or frameworks for service delivery would be discussed. Also, these theories would be related to the how NDMC

used 311 app/digital automation for service delivery and its impact on public services.

Chapter 4: Development and Implementation of the App

Describe the app and digital interface of NDMC, its features, and functionalities.

Discuss the development process.

Explain how the automated service delivery was introduced and implemented in the public service sector.

Chapter 5: A Critical Examination of electricity and property services by NDMC:

Data would be collected from primary and secondary sources on the selected services sectors of electricity services and property services towards analysing the effectiveness of the end to end service delivery without human intervention and assessing any existing gaps.

Chapter 6: Impact Assessment

Evaluate the impact of the automated services provided by NDMC through the 311 app/digital automation.

Discuss how it has improved efficiency, accessibility and user satisfaction.

Highlight any challenges or drawbacks identified during the assessment

Chapter 7: Conclusion and Recommendations. This chapter will Summarize the main findings of the research and discuss the overall impact of the app on public service delivery while addressing the research objectives and questions. It shall bring out the recommendations for the technology policy framework in Indian context based on the experience of NDMC while also suggesting the changes required to refine the process of e-governance which will address institutional voids if any are assessed in the research.

CHAPTER II

LITERATURE REVIEW

To get a comprehensive overview and understanding of the existing research and literature relevant to the research topic a detailed literature review has been undertaken. It helps to provide a theoretical and conceptual framework for the research by highlighting key concepts, theories, and methodologies that have been used by other researchers in the field. Additionally, it helps to establish the significance and relevance of the research by demonstrating how it builds upon and contributes to the existing literature. Overall, the literature review is an essential component of a research as it provides the foundation for the research by establishing the context, identifying gaps and research questions, and providing a theoretical framework for the study.

The study aimed an insight into AI adoption in different sectors with special reference to India. It also explored the best practices of AI adoption in other countries (USA and Singapore) and suggests what can be inducted for India. The study has also proposed conceptual framework of adoption, implementation of AI and Governance of AI in India (Chhabra, 2022).

The study has dwelled upon three aspects, firstly digital technologies enable to achieve the Sustainable Development Goals (SDGs) and strengthen the relationship between the state and its citizens, Secondly, challenges that usually confront the uptake of digital technologies in governance especially in Indian context and thirdly, the face of governance in the wake of emerging technologies including artificial intelligence, transparently immersive techniques, and newer digital platforms. It has also proposed some viable strategies that can strengthen the application of digital technologies in governance, especially in the Indian context (Malhotra, 2018).

Sangita, Satyanarayana (2007) has tried to give the relation of quality of governance and service delivery with decentralization in India. The theory is based on concepts with some practical applications for testing the concepts. The framework of this study is based on the democratic decentralization and its likely impact on government institutions and service provision in India.

The paper focuses on the pace at which emerging technologies are developing, disrupting, transforming and converging to create even more complex technologies and has left governance structures with problems like policy decay, maintaining trust etc. Governance hence needs to be agile which can be achieved only by incorporating these technologies in the governance structures. It brings out the methods and tools essential for implementing agility through emerging technologies are elaborated (Malhotra, 2019).

The National Association of Software and Service Companies (NASSCOM) strategy report focuses on five megatrends namely Asian Economic Eminence, Mass Urbanization and Hyper-Personalization, Environmental Sustainability Stress, Data-Led Economy and Disrupted Future of Work. Addressing these megatrends will require unprecedented coordinated action from governments, corporates and citizens, and technology will emerge as the foundation for success. Further, nine interconnected, rapidly evolving, high impact digital technologies- Big Data Analytics, Cloud Computing, Cybersecurity, Artificial Intelligence, Internet of Things, 3D Printing, Robotics, Blockchain, and Immersive Media can create opportunities up to USD 33 trillion ("Technology Sector in India 2020 - TECHADE- The New Decade Strategic Review", n.d.).

Lindquist (2013) explores the relationships between citizens and their governments in while studying the three areas of improved service delivery, citizen engagement and the application of digital technology. He mentions that there will continue to be expectation gap between the citizens keep on wanting more and the government which makes various attempts to improve service delivery so as to become more citizen centric.

Hilvert and Swindell (2013) have described the various challenges faced by local government managers and the opportunities for innovative service delivery. They emphasize that collaboration with private, non-profit, or other public entities has emerged as a key approach to achieving high-quality and cost-effective service delivery in local communities. They highlight the importance of local innovation, collaborative governance, public-private partnerships, service delivery arrangements, and manager tips as key factors to consider in the collaborative service delivery process.

Sridhar (2007) has given focus to urban public service delivery, particularly concerning the water supply sector. The vastness of the literature on urban service delivery is noted, with emphasis on the specific studies that hold high relevance to this subject matter

Industry 4.0 article mentions that Consumers and producers will move closer together in the future. The customers themselves could design products according to their wishes e.g., sneakers designed and tailored to the customer's unique foot shape. At the same time, smart products that are already being delivered and in use can send data to the manufacturer. With this usage data, the manufacturer can improve his or her products and offer the customer novel services.

As per UNDP Policy Document on Good Governance Practices for the Protection of Human Rights to respect this citizen-centricity, the paradigm of 'Good Governance' has been popularly accepted as an ultimate form of governance across all democratic countries. Good Governance upholds the core principles of participation, transparency, responsiveness, effectiveness, and accountability (UNDP, 1997)

The study brings out that the expectations of citizens can be ideally fulfilled by achievement of action areas identified by seventeen aspirational Sustainable Development Goals by UNDP in 2015, also known as 'Global Goals'. The aim of SDGs is to achieve social development, economic development and environmental sustainability for the planet so that there is

peace and prosperity for people. Digital technologies can serve as a powerful tool to achieve SDGs through means and mechanisms that strictly adhere to the basic principles of Good Governance (Malhotra, 2022).

CHAPTER III

THEORETICAL FRAMEWORK

The theoretical aspects of which would help in explaining the digital models or frameworks for service delivery would be discussed. Also, these theories would be related to the how NDMC used 311 app/digital automation for service delivery and its impact on public services.

Introduction

The integration of technology into governance, popularly known as e-governance, has become a global trend aimed at transforming the relationship between governments and citizens, fostering transparency, accountability, and service delivery efficiency (Bertot et al., 2010)[2]. Municipal corporations, as the primary providers of essential public services, stand to benefit significantly from e-governance initiatives. The '311 App', a non-emergency service request and information platform, represents a powerful tool for e-governance, enabling the end-to-end delivery of public services in a citizen-centric and efficient manner. This introduction delves into the theoretical underpinnings of the 311 App model, exploring how it embodies principles of e-governance and contributes to the broader discourse on good governance.

E-Governance: A Paradigm Shift in Service Delivery

Traditionally, public service delivery has been plagued by bureaucratic complexities, information asymmetry, and a lack of responsiveness. E-governance disrupts this paradigm by leveraging information and

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[2] • Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools. *Information Polity*, 15(4), 263-283. https://www.researchgate.net/publication/331129043_Experiments_with_a_data-public_Moving_digital_methods_into_critical_proximity_with_political_practice

communication technologies (ICTs) to streamline processes, increase citizen access to information, and enhance government responsiveness (Meijer & Rodríguez Bolívar, 2016)[3]. The NDMC's 311 App exemplifies this shift, providing a unified digital gateway for citizens to access municipal services. Instead of navigating complex websites, visiting government offices, or enduring long wait times on phone lines, citizens can simply use the app to report issues, request services, and monitor their progress in real-time.

Citizen-Centric Governance and New Public Management

The theoretical foundations of the 311 App align with the principles of New Public Management (NPM) and citizen-centric governance. NPM emphasizes market-oriented approaches, performance measurement, and customer service orientation within the public sector (Hughes, 2012)[4]. The 311 App embraces these principles by providing a convenient platform for citizens to communicate their needs, track service delivery metrics, and offer feedback, enabling municipalities to function with a stronger customer service focus. Furthermore, the app supports a shift toward a more collaborative model of governance, where citizens are engaged as active participants rather than passive consumers of services (Ganapati & Reddick, 2014)[5].

Transparency, Accountability, and Good Governance

Good governance rests upon pillars of transparency, accountability, inclusiveness, and responsiveness (Wong & Welch, 2004)[6]. The 311 App supports these pillars in multiple ways. By creating a centralized repository of service requests and resolutions, the app enhances transparency into municipal operations. Citizens can track the status of their requests and view data on service delivery metrics, thereby holding municipalities accountable for their

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[3] Meijer, A. J., & Rodríguez Bolívar, M. P. (2016). Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), 392-408. https://doi.org/10.1177/0020852314564308

[4] Hughes, O. (2012). *Public Management and Administration: An Introduction* (4th ed.). Palgrave Macmillan.

[5] Ganapati, S., & Reddick, C. G. (2014). Open e-government in U.S. cities: Promises, practices, pitfalls. *E-Government Information Systems Research and Development*, 106-120. https://doi:10.4018/978-1-4666-6142-5.ch008

[6] Wong, W., & Welch, E. (2004). Does E-government promote accountability? A comparative analysis of website openness and government accountability. *Governance*, 17(2), 275–297.

performance (Singh & Jain, 2016)[7]. Moreover, the app's feedback mechanisms and rating systems facilitate two-way communication between citizens and service providers, promoting responsiveness and continuous improvement.

The advent of e-governance, the application of information and communication technologies (ICTs) to transform government processes and service delivery, has revolutionized the traditional relationship between citizens and their governments. This paradigm shift from bureaucratic opacity to tech-driven transparency and efficiency holds the promise of greater government responsiveness, increased citizen participation, and improved quality of public services.

Theoretical Foundations

New Public Management (NPM): E-governance aligns with NPM principles emphasizing customer-centric service delivery, performance metrics, and the use of technology to streamline processes (Hood, 1991). By adopting online platforms, real-time tracking, and feedback mechanisms, e-governance helps governments achieve higher levels of efficiency and citizen satisfaction.

Network Governance: Network governance highlights the changing nature of public service delivery where multiple actors, including government agencies, businesses, and NGOs, collaborate to address complex societal challenges (Rhodes, 1997). E-governance facilitates collaboration through tools like online forums, shared databases, and interoperable systems, enabling more holistic problem-solving.

Digital Era Governance (DEG): DEG emphasizes the transformative power of technology in shaping government operations, citizen engagement, and policy-making (Dunleavy et al., 2006)[8]. It encompasses not only the provision of services through digital platforms but also the use of data analytics for

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[7] Singh, N., & Jain, K. (2016). E-governance in India: Initiatives and challenges. *Indian Journal of Public Administration*, 62(4), 596–616.

[8] Dunleavy, P., Margetts, K., & Bastow, S. (2006). *Digital Era Governance: IT-Challenges and Public Services* (Vol. 3). Oxford University Press.

evidence-based decision-making and the development of 'smart governance' systems that leverage technologies like IoT and AI.

Prof (Dr) Charu Malhotra's paper on E-Governance in India provides invaluable insights into the implementation and impact of e-governance in a developing country context. She highlights the role of e-governance in improving transparency, reducing corruption, and bridging the gap between citizens and government institutions (Malhotra, 2008)[9]. Her research sheds light on factors influencing citizen adoption of e-services and emphasizes the need for inclusive design and outreach initiatives to reach marginalized communities.

E-Governance in Practice: Key Transformations

Service Delivery Transformation: At its core, e-governance transforms the way citizens access government services. Online platforms, mobile apps, and self-service kiosks streamline the process of requesting services, reporting issues, and making payments, reducing wait times and eliminating unnecessary physical visits to government offices.

Transparency and Accountability: E-governance promotes transparency by making public information readily available through digital portals and enabling citizens to track the progress of their requests (Bertot et al., 2010). These platforms enhance accountability by creating a digital audit trail, empowering citizens to hold officials accountable for their performance.

Citizen Participation and Empowerment: E-governance provides citizens with unprecedented opportunities to engage with their governments beyond traditional voting mechanisms (Nam, 2012). Digital platforms facilitate public consultations, online surveys, e-petitions, and direct feedback channels, enabling citizens to have a greater voice in shaping policies and service delivery.

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[9] Malhotra, C. (2008). E-governance for transforming governance in developing countries: A framework for successful implementation. *The Electronic Journal of Information Systems in Developing Countries*, 23(4), 1-22.

Data-Driven Governance: E-governance platforms generate valuable data on service requests, citizen preferences, and performance metrics. Analysing this data helps governments identify inefficiencies, target interventions more effectively, and engage in evidence-based policymaking (Janssen et al., 2012)[10].

Challenges and Limitations

Digital Divide: Despite significant progress, the digital divide remains a barrier for many. Ensuring inclusivity and accessibility of e-services for citizens with limited digital literacy, disabilities, or those residing in remote areas is crucial (Jaeger & Bertot, 2011).

Cyber Security: E-governance systems require robust cybersecurity measures to protect sensitive citizen data and maintain trust in government institutions,

Capacity Building: Implementing successful e-governance initiatives necessitates technical expertise, digital infrastructure, and a change in bureaucratic culture within government institutions.

E-governance represents a significant paradigm shift in the way governments interact with their citizens. By prioritizing citizen-centric design, utilizing data effectively, and fostering collaboration across stakeholders, e-governance can lead to more efficient, transparent, and responsive public service delivery. Addressing the challenges of the digital divide, cybersecurity, and capacity building is essential for realizing the full potential of e-governance for good.

The Indian Context: E-Governance and Urban Development

India has made significant strides in e-governance through initiatives like Digital India and the Smart Cities Mission. The NDMC's 311 App and the

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[10] Janssen, M., Kuk Gwang No, & Kukla, G. (2012). *E-government for the 21st century: A global perspective*. Palgrave Macmillan.

Sewa Sindhu in Karnataka aligns with these national efforts by offering a digital solution for streamlining urban service delivery (Kumar & Panneerselvam, 2018)[11]. It addresses challenges specific to Indian cities such as burgeoning populations, infrastructure strain, and varying levels of digital literacy. Successful implementations of 311 style apps in Indian cities demonstrate the potential for technology-driven solutions to improve the quality of life for urban residents.

India's rapid urbanization presents immense challenges for city authorities. Issues like burgeoning populations, infrastructure strain, and rising demand for essential services necessitate innovative governance models. E-governance offers a transformative framework for addressing these urban challenges, leveraging ICTs to improve service delivery, enhance citizen engagement, and promote sustainable and inclusive urban development.

Theoretical Perspectives

New Public Service (NPS): NPS emphasizes a collaborative, citizen-driven approach to public service delivery, moving beyond traditional bureaucratic models (Denhardt & Denhardt, 2007). E-governance supports the NPS principles by enabling co-creation of urban solutions through online platforms, citizen feedback mechanisms, and public-private partnerships.

Urban Transformation Frameworks: E-governance aligns with contemporary urban transformation frameworks that emphasize the use of technology, data analytics, and 'smart city' concepts to address urban complexities (Albino, Berardi, & Dangelico, 2015). Indian e-governance initiatives are frequently integrated with broader Smart Cities Mission goals.

Network Governance: Given the multi-stakeholder nature of India's urban landscapes, network governance theory becomes relevant in understanding

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[11] Kumar, P. A., & Panneerselvam, P. (2018). E-governance initiatives in Tamil Nadu – A study on citizens' awareness. *International Journal of Mechanical Engineering and Technology*, 9(8), 1025-1032.

how tech-enabled platforms can facilitate inter-agency coordination, collaboration with NGOs, and public-private partnerships in service delivery (Rhodes, 1997).

E-Governance Initiatives and Urban Challenges

Streamlining Public Services: E-governance portals (both national and state-level) provide citizens with a single point of access for services like bill payments, property tax management, applications for certificates, and grievance redressal. This significantly reduces the need for visits to government offices and promotes greater efficiency in urban service delivery (Kumar & Panneerselvam, 2018).

Civic Infrastructure Monitoring: E-governance initiatives can include IoT-based sensors, smart meters, and GIS mapping to monitor critical urban infrastructure like water supply, waste management, and traffic systems (World Bank Group, 2015). This data-driven approach enables proactive maintenance and optimization of resources.

Citizen-Centric Governance: E-governance platforms in India incorporate tools like public polls, online consultations, and feedback channels for capturing citizen preferences on urban development priorities (Meijer & Thaens, 2010). These initiatives contribute to making urban governance more participatory and responsive to citizen needs.

The Indian Perspective

Digital India Initiative: The Digital India initiative provides the overarching policy framework and funding for the expansion of e-governance in India, including urban areas (Government of India, 2023). This national commitment has galvanized state-level and municipal e-governance projects.

Smart Cities Mission: India's Smart Cities Mission places a strong emphasis on technology-driven solutions for urban development (Smart Cities Mission, 2023). E-governance platforms are integral to achieving

goals like citizen-centric service delivery, integrated infrastructure management, and enhanced public safety. Scholars like Shafi, Pandey, and Sharma (2014) have extensively researched the implementation, challenges, and impact of e-governance projects in Indian cities. Their work reveals the nuanced interplay of technology, socio-economic factors, and bureaucratic culture in shaping e-governance outcomes.

Challenges and Opportunities

Digital Divide and Inclusion: Despite significant progress, digital literacy disparities and uneven access to technology remain a challenge, particularly for the urban poor and marginalized groups (Singh & Jain, 2016). E-governance initiatives must incorporate offline access, localized language support, and capacity-building efforts.

Cybersecurity and Data Privacy: Robust measures to protect citizen data and safeguard critical infrastructure from cyber threats are essential to maintain public trust in e-governance systems.

Coordination and Capacity Building: Integrating e-governance platforms across diverse urban departments and agencies often requires a significant shift in bureaucratic processes and technical know-how.

E-governance holds immense potential to transform urban governance in India. Through streamlined service delivery, data-driven decision-making, and enhanced citizen engagement, it can improve the quality of life in India's cities. Addressing the challenges of inclusivity, security, and institutional capacity will pave the way for the successful implementation of e-governance and realizing its benefits for India's urban future.

Data-Driven Decision Making

A key theoretical advantage of the NDMC's 311 App lies in its ability to generate rich data on service requests and performance metrics.

Municipalities can analyse this data to gain insights into demand patterns, identify hotspots of civic issues, and proactively address recurring problems (Bertot et al., 2010)[12]. Data-driven decision-making empowers municipalities to optimize resource allocation, improve service delivery processes, and deliver a greater return on investment on public infrastructure.

Data-driven decision-making represents a shift away from reliance on intuition and gut feelings towards a more evidence-based approach to problem-solving and strategy development. By leveraging data, analytics, and insights, organizations – both within the public and private sectors – can make more informed decisions, improve efficiency, and minimize risk.

Theoretical Underpinnings

Knowledge Management and Organizational Learning: Data Driven Decision Making (DDDM) aligns closely with concepts of knowledge management and organizational learning. By gathering and analysing data, organizations systematically learn about their processes, customers, and environment, enabling them to adapt and improve their decision-making processes over time (Argote & Miron-Spektor, 2011).

Rational Choice Theory: This theory posits that individuals and organizations make decisions based on a rational assessment of costs and benefits (Coleman & Fararo, 1992). DDDM provides the quantifiable data critical for such a rational assessment, allowing for more informed choices that optimize outcomes.

Bounded Rationality: Herbert Simon's concept of bounded rationality acknowledges that human decision-making is constrained by information availability and cognitive limitations (Simon, 1957). DDDM augments cognitive capabilities by providing access to broader data sets and analytical

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[12] ● Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools. *Information Polity*, 15(4), 263-283. https://www.researchgate.net/publication/331129043_Experiments_with_a_data-public_Moving_digital_methods_into_critical_proximity_with_political_practice

tools, mitigating biases and improving decision quality within these constraints.

Behavioural Economics: Traditional economic models assume fully rational decision-making by actors. However, behavioural economics emphasizes the impact of psychological factors and cognitive biases on decision-making (Kahneman, 2011). DDDM can counterbalance these biases by introducing more objective data into the process.

Key Stages of Data-Driven Decision-Making

Problem Definition: Clearly framing the question or challenge the organization seeks to address is crucial for ensuring that relevant data is collected and analysed.

Data Collection: This encompasses gathering data from internal sources (CRM systems, databases), external sources (market research, public data), and via real-time monitoring systems where applicable. Data quality, relevance, and reliability are essential considerations. A leading authority on DDDM, Davenport emphasizes the importance of organizational culture, data quality, and the integration of analytics into everyday business processes (Davenport, Harris, & Morrison, 2010).

Data Analysis: Statistical techniques, data visualization tools, and machine learning models (if applicable) help transform raw data into meaningful insights and patterns. Siegel highlights the potential of predictive analytics and its role in driving informed decision-making (Siegel, 2013).

Decision-Making: Leaders and managers interpret the insights, consider the context of the organization's goals, and weigh potential options. The 'data-driven' approach emphasizes using insights to guide decision-making rather than solely relying on intuition or past experience.

Monitoring and Evaluation: Implementing continuous monitoring and measuring the impact of decisions is crucial to assess effectiveness and identify areas for improvement. This feedback loop is essential for continuous learning and refinement of the DDDM process.

Challenges and Considerations

Data Quality: The reliability and accuracy of data is paramount; poor data quality leads to misleading insights and misguided decisions.

Data Literacy: Organizations must invest in developing data literacy across departments and management levels to ensure effective utilization of data insights.

Ethical Considerations: DDDM must adhere to ethical principles regarding data collection, privacy protection, and the avoidance of algorithmic bias.

Data-driven decision-making represents a powerful shift in organizational and governmental operations. By systematically harnessing data and analytical insights, organizations enhance their ability to make informed choices, achieve greater efficiency, and drive innovation. As technology and data analysis techniques evolve, DDDM promises to become increasingly integral to success in both the private and public sectors.

Limitations and Challenges

Despite the significant advantages offered by the 311 App, it's important to acknowledge potential limitations and challenges. The digital divide remains a concern, and efforts must focus on ensuring inclusivity and accessibility for all citizens regardless of technological proficiency (Jaeger & Bertot, 2011)[13]. Additionally, the success of the app hinges upon robust back-end systems for routing requests, coordinating service providers, and ensuring timely

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[13] Jaeger, P. T., & Bertot, J. C. (2011). Transparency and technological change: Ensuring equal and sustained access to government information. *Government Information Quarterly*, 27(4), 371–376. https://www.sciencedirect.com/science/article/pii/S0740624X10000584

resolutions. Municipalities need to invest in technological infrastructure and staff training to ensure seamless operation of the app.

While data-driven decision-making (DDDM) offers significant advantages, it's crucial to acknowledge that it isn't a panacea. Intrinsic limitations and a range of practical challenges can limit its effectiveness if not carefully considered.

Limitations of Data

Incomplete Data: Real-world data is often messy and incomplete. Missing values, inconsistencies, and biases within datasets can skew the insights and lead to faulty conclusions (Davenport, Harris, & Morrison, 2010).

Data Doesn't Equal Understanding: Even robust data fails to capture the full nuances of human behaviour, motivations, and complex social phenomena. As decision-makers, it's vital to recognize when qualitative context is required alongside data insights (Siegel, 2013).

Correlation vs. Causation: DDDM often excels at revealing correlations between variables. However, mistaking correlation for causation risks ineffective conclusions. Critical thinking skills and domain knowledge are needed to assess the true nature of the relationships that data uncovers.

Operational Challenges

Data Quality and Governance: Ensuring data accuracy, consistency, and security is an ongoing challenge. Robust data governance policies are essential for fostering trust and mitigating the risk of decisions based on erroneous data (Marr, 2015).

Skills Gap: Data literacy across the organization is necessary for effective DDDM. Without the ability to collect, analyse, interpret, and communicate with data, organizations fail to extract its full value (Davenport et al., 2010).

Organizational Inertia: A successful shift towards DDDM frequently requires significant changes in organizational culture and workflows.

Resistance to change and a preference for traditional, intuition-based decision-making can hinder implementation.

Cost and Infrastructure: Investing in data collection, storage, and analysis platforms can be expensive. Organizations, particularly those in the public sector, might face budgetary constraints when implementing DDDM initiatives.

Ethical Considerations

Algorithmic Bias: If the data used to train machine-learning models contains inherent biases, the resulting models risk perpetuating and amplifying those biases (Siegel, 2013). Careful attention is needed to ensure fairness and prevent discriminatory outcomes.

Privacy Concerns: DDDM often involves the collection of large amounts of personal data. Striking the right balance between utilizing data for insights and respecting individual privacy is an ongoing ethical challenge, particularly in sectors like healthcare and social policy.

Lack of Transparency: The complexities of DDDM and the reliance on predictive analytics can lead to a "black box" phenomenon where decision-making processes lack transparency. This raises concerns about accountability and public trust, especially in high-stakes domains (Marr, 2015).

Navigating the Limitations and Challenges

Combining Data with Expertise: DDDM should complement, rather than replace, human judgment and expertise. Industry knowledge and an understanding of context are essential for interpreting data insights and making sound, well-rounded decisions.

Fostering Data Literacy: Organizations need to invest in initiatives that cultivate data literacy across all levels. This empowers employees to work

effectively with data, derive meaningful insights, and challenge assumptions.

Proactive Data Governance: Having robust data governance policies and processes in place ensures data integrity, privacy protection, and builds trust in DDDM outcomes.

Emphasizing Explainability: Efforts should be made towards creating explainable and transparent models that can articulate the reasoning behind predictions or recommendations, particularly in sensitive domains.

Recognizing the limitations and actively addressing the challenges related to DDDM is key to maximizing its potential. By combining data-driven insights with human expertise, promoting data literacy, upholding strong data governance, and prioritizing ethical considerations, organizations can overcome limitations and unlock the true power of DDDM for better decision-making, innovation, and success.

To understand the area and the importance of functioning of NDMC it is better to understand a bit about the history of NDMC which is as follows: -

In 1911 the British Government decided to shift the capital of India from Calcutta to Delhi. On 12th December 1911, it was announced that Delhi would be the place of residence of the Viceroy and the new administrative centre. A Committee was constituted to select the site for the new capital. A number of sites were examined and finally Raisina Hill was selected for building the new capital of India. The English town planners led by Edwin Lutyens and Herbert Baker and others created the present New Delhi with avenues dominated by the palace of the Viceroy (now Rashtrapati Bhawan), Circular Pillar Palace, known as Parliament Secretariat building, green spaces, parks and gardens.

The construction of the new capital was a task of great magnitude. It was considered necessary that instead of leaving the control of construction and management to the local authority, a central authority may be entrusted with this work. This resulted in the formation of the constitution of the Imperial Delhi Committee on 25th March, 1913. This was the beginning of the New Delhi Municipal Committee.

In February 1916 the Chief Commissioner, Delhi, created the Raisina Municipal Committee. It was upgraded to a 2nd class Municipality under the Punjab Municipal Act on 7th April 1925. This Committee consisted of ten members appointed by the Local Government either by name or by office. In the first Committee so constituted five members were appointed ex-officio and five by name. For the first time public men were included to participate in the deliberation of local affairs/problems. On 9th September 1925, this Committee was allowed to impose tax on buildings and thereby the first source of revenue was created. The Chief Commissioner also transferred many administrative functions to the civic body whose income and expenditure grew noticeably.

On 22nd February 1927, the Committee passed a resolution to the effect that the name "New Delhi" be adopted and this Committee was designated as "New Delhi Municipal Committee" which was approved by Chief Commissioner on 16th March, 1927.

On 15th February, 1931, the new capital was officially opened. In the year 1932, the New Delhi Municipal Committee became a 1st class municipality. It was entrusted with supervisory powers to look after all the services and activities it was called upon to undertake.

In the year 1916, this municipality was discharging the responsibility to cater only to the sanitation requirements of the workers engaged in the construction of the new capital. From 1925 onwards, the functions of the municipality increased manifold. In 1931 functions in connection with buildings, roads, sewers, medical and public health arrangements were transferred to the Committee. Further in 1932 works of Electricity distribution and Water supply were also transferred to this civic body.

During the last ninety years of its existence, this Civic Body has grown into an organization with the responsibility of beautifying the city and providing civic services. This civic body has always laid stress on quality of service. During this period the Municipality provided an underground sewer system in the whole of its area. There were a number of open Nallas, which had become breeding grounds for malaria. All big open Nallas have been covered and reclaimed land has been utilized for construction of public utility services as well as greenery.

The New Delhi Municipal Committee (NDMC) was superseded in February 1980. Thereafter an Administrator headed it till the introduction of new Act in May 1994.

In May 1994, the NDMC Act 1994 replaced the Punjab Municipal Act 1911 and the Committee was renamed as the New Delhi Municipal Council. The Act has been passed by the Parliament. The Central Government appointed a Special Officer under Section 418 of NDMC Act 1994 till the nomination of the Members. The 1st meeting of the Council took place on 23rd Dec. 1995.

In accordance with NDMC Act, 1994, a thirteen-member council headed by a Chairperson governs the NDMC. Out of 13 members 2 members of Legislative assembly, 5 from amongst the officers of the Central Government or the Government or their undertakings, to be nominated by the Central Government, 4 members to be nominated by the Central Government in consultation with the Chief Minister of Delhi to represent from amongst eminent personalities. The MP of New Delhi, presenting constituency which

comprises wholly or partly the New Delhi area. The other statistics of relevance are as listed :-

Area: 42.7 sq.km
Resident Population: 0.25 million
Floating Population: 1.6-2.0 million/ day
Population Density: 5850 pers. / sq. km
48% green cover against Delhi's 21 %
Cleanest & greenest part of the capital

The new age New Delhi Municipal Council (NDMC) has taken forward the dreams of present Hon'ble Prime Minister by implementing several IT based initiatives through technology intervention for strengthening of e-Governance and m-Governance to improve efficiency and effectiveness in providing civic services in an equitable, non-discretionary and transparent manner. Therefore, it was in 2016 that the corporation began its efforts of launching E-governance through an App and finally in 2018 the same was achieved by the NDMC.

The NDMC's reach out towards citizen centricity through the '311 App' represented a significant innovation in e-governance, offering a theoretical and practical framework for municipalities to revolutionize public service delivery.

CHAPTER IV

DEVELOPMENT AND IMPLEMENTATION OF THE 311 APP

'Digital India' program, an initiative by Hon'ble Prime Minister Sh. Narendra Modi emerged with the idea to provide government services to citizens electronically, create digitally literate citizens, and eventually transform India into a digitally empowered economy.

New Delhi Municipal Council (NDMC) has taken forward the dreams of Hon'ble Prime Minister by implementing several IT based initiatives through technology intervention for strengthening of e-Governance and m-Governance to improve efficiency and effectiveness in providing civic services in an equitable, non-discretionary and transparent manner. Some of the key objectives of various IT based initiatives taken by NDMC are:-

To Empower Citizen

Without the use of technology, the municipality used to suffer from a slew of issues including lack of transparency, ineffective governance and poor accountability of resident grievances. A need was felt to put in place a system where the resident is empowered to demand his public services in a transparent and efficient manner.

To Improve Service

Service improvement is one of the cornerstones of digital transformation. Citizens must enjoy a better service and their needs must be met faster and more completely.

To Increase Efficiency

Using the unmatched power of modern technology, workflows can become faster, slicker, and more repeatable. Citizens also benefit from increased efficiency in their dealings with organizations.

To Improves Convenience

Paperless processes provide constituents with on-demand access to applications, information and other services that traditionally require a trip to govt offices. By digitizing operations, governments can more efficiently process claims, applications and license requests, resulting in higher public satisfaction.

To Enables Remote Work & Business Continuity

Even on days when government offices are closed, e-services continue to be delivered. One can submit applications also. Enable employees to access crucial data, from any location, through any device, at any time

To Cut Costs

Digital document management eliminates the cost of printing and mailing documents to citizens. Online payment options also reduce transactions' processing costs. In NDMC data of money saved on printing is given below:-
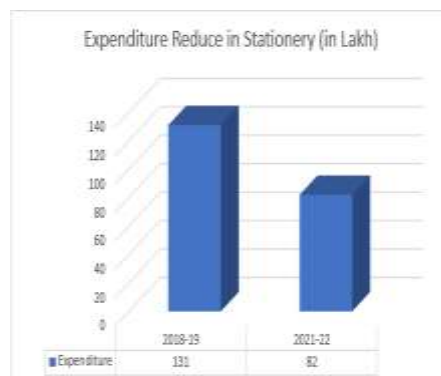
Figure 1 : Expenditure reduced in Stationery (Source NDMC Database)
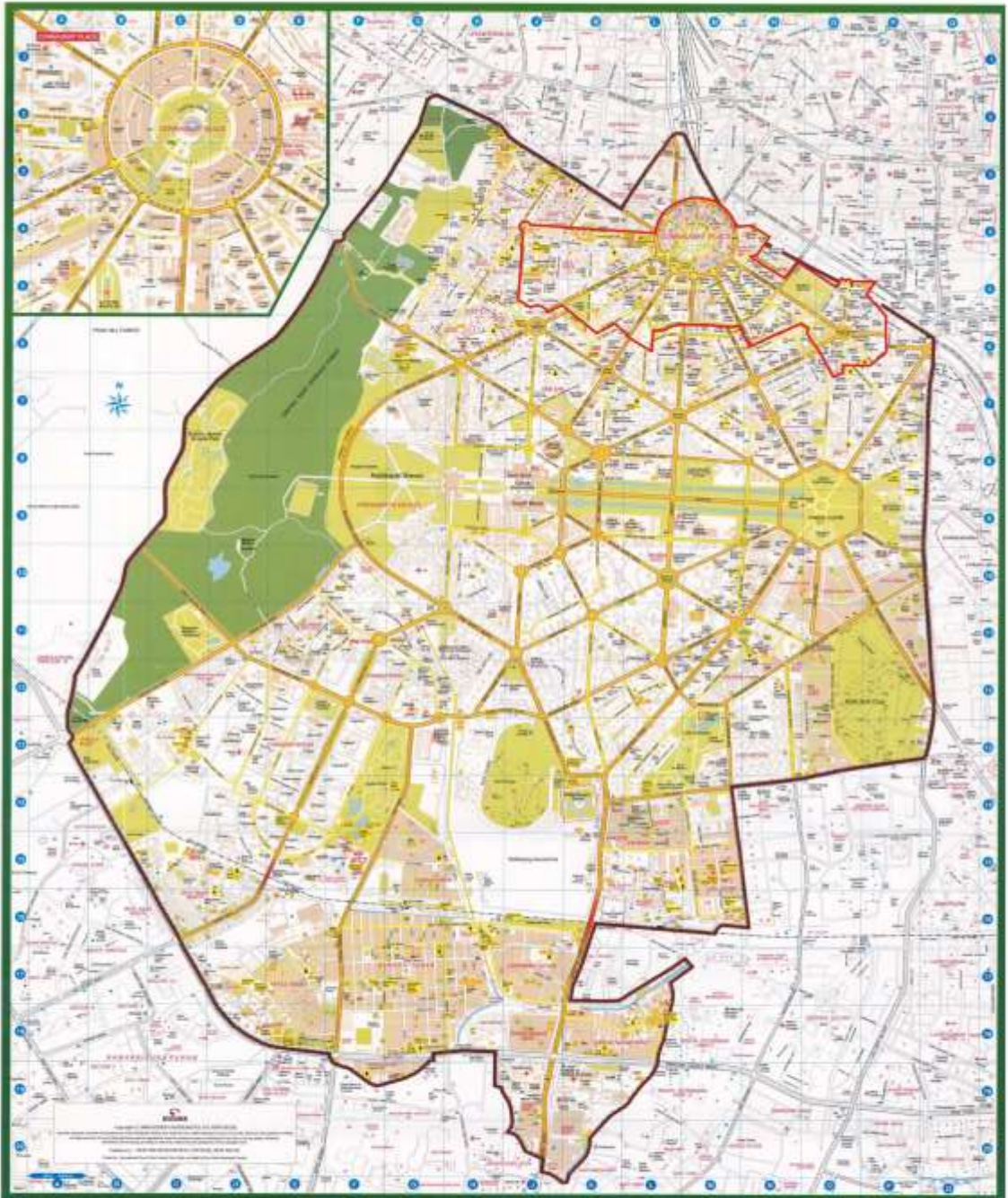
New Delhi Municipal Council
Palika Kendra, New Delhi

Figure 2: MAP OF AREA UNDER NDMC

Above mentioned objectives were achieved by NDMC by implementing e-governance by introducing 49 online services. Citizen can avail these 49 civic services through online mode by using Single Sign On (SSO) facility and through mobile App also.

INFORMATION TECHNOLOGY DEPARTMENT, NDMC

For greater accountability, transparency, efficiency and promptness, increase reliance has to be made on the online services under the e-Governance. Extensive usage of mobile application in e-governance platform has been envisaged even under the digital India program of Govt of India. Mobile platform is the most convenient for Government to Citizen (G to C) and Citizen to government (C to G) interface.

The mobile app incorporates Global Information System (GIS) platform to provide various layers of services thereby reducing the cost of services, making governance citizen friendly, reducing the physical interface with the staff and official and it is an ideal platform for obtaining feedback and for online monitoring of programme, activities and the delivery of services. Smart City Officer Apps has the following modules:

Field Inspection/Monitoring module

GPS attendance module

Project Tracking Module

E-Challan module

VBD tracker (Vector Borne Disease)

311 App Scope of Work (Deliverables)

Customization, Configuration, Hosting & Maintenance of Mobile App for Monitoring of NDMC Civic Services public grievance redressal and integration with existing NDMC Call centre and CRM on monthly license basis.

Following sub modules are required as a bundle of application for NDMC Civic Services Mobile App which essence would have inter-alia the feature defining the work flow to and from in a defined hierarchical order, capturing the geo-location, images, real time updating editable at the level of authorized administrators.

Sr.No	Sub-Modules	Features Required
1	Citizen Relationship Module (CRM)	CRM module was developed for registering complaints from various sources i.e. through citizen app, web app, twitter, Facebook, WhatsApp and telephone etc. Existing CRM module data was migrated in new CRM. Complaints will automatically follow the allocation work flow and department wise hierarchies. Each hierarchy level must follow escalation matrices and as per SLA. It is a Web based Dashboard and will have central admin module that will manage 'NDMC Civic Services Monitoring Mobile App' Module system on single Uniform Resource Locator (URL). This feature will broadly cover the following sub-modules: – Issues reported via Website, Phone/Hotlines, Twitter, Facebook, WhatsApp and Mobile apps

		are all aggregated into one Central Service Management System, where government officials can follow, acknowledge and close issues. – Using this app, officials can make a smart decision, can keep real time track of resources, report by categories & request type plotted across wards, urban zones and neighborhood. – At Senior official levels can analyse the complaint system based on real time data. The CRM has features of: - Simplicity and ease of integration. - Remote access. - Mobile access. - Stronger multichannel support. - Integrated analytics. - Campaign management. - There should be role-based dashboard - CRM is integrated with the Citizen and Officer's App. - CRM is integrated with SMS facility. - List management/master data management. - Flexibility and customization. - Lead generation and follow-up tracking.
2	Field work monitoring module (General)	This module is used to report day-to-day field inspections activities of various categories/departments. This module enables the field staff to capture photo of the inspected site/installations and GPS Information of the locations, which automatically

		tags its respective circles and zones. There is provision for writing description and returning remarks Using this module, senior officers can track down the progress in the reported field. The messaging / commenting system of this application enables senior officers to make task specific communication. Field inspection include GPS enabled road inspection, schools, buildings, main holes, bell mouths, sewerages, water leakage and any other related inspection.
3	Attendance Module	A unique user ID and location (GPS coordinate) along with selfie association would be required in this application. A time and attendance software will be installed on workstation to process the data received from user's mobile and store the information (time, entry and leaving) to the Database. Officers are able to track down information regarding the attendance of field staff based on GPS coordinates. Exact location and time of the staff can be known and the time duration between two /multiple logs on the same 24 hours' period. This can be used to ascertain whether a staff has visited the area of inspection/ event place. Since location-based time and attendance system use Mobile Application and a time and attendance management sub module for processing data. So,

		the flows of operation of the Mobile application are: - -Determine the location using GPS C-heck the location with pre-stored (office/workspace) location -Encrypts user ID and Location -Send information to the system -Count the hours between entry time and exit time
4	Project Tracking Module	This was designed to be able to deliver a fully functional and user interactive online tool which can enhance and help various project management of various department users to manage and compile their work efficiently and productively Scope includes:- Creates different users of Departments with varied roles and scopes. Confirms each member by providing activation codes. Manages all project details like tasks, deadlines, team members and resources. Assigns different tasks to different members. Provides documentation to the members about the projects Update all members about new proceedings in the project. Binds all the information provided by the team members at one place and show it to all others. Maintains start date and end date of each project

		Maintains the overall timeline of the project with Dash board.
		This module enables the field officers/officials to pursue and manage physical and financial progress of various projects (for e.g. Drainage or Water supply.) This module contains following features:
		A. Administrator Level
		Administrator able to create/Modify Department/Division.
		Create New Task/project: - The Administrator create new tasks/project and assigns them to the desired officers/officials.
		Create Message: - The Administrator can create Message for the other team members notifying them about project updates etc.
		Generate Report: - The Administrator can generate reports for the various task and project.
		Decide Deadline: - The Administrator can decide the time needed for the task to be completed.
		Update Project Status: - The Administrator can update the completion status of the project on time-to-time basis.
		B. Field Officers level
		Update Task Status: - The staff working on the particular task can update the task completion status.
5	e- Challan Module for unauthorized hawking/encroachment	This module enables the field staff to issue online challan for any unauthorized

		hawking/encroachment under the relevant sections of the NDMC Act and also to submit online challan to the Municipal Magistrate of NDMC through their mobile enabled applications. These challans can be directly sent to offenders via SMS/ WhatsApp/ Email. Features for e-Challan System:- -Photo capturing and transmission Violation booking -e-challan Generation -Postal dispatches -Postal Statement -Postal returns and return info feeding -Action dropouts as per Court decisions -Report Generation -Online Pending Challan Verification -Online Violation photo view facilities -Upgrading the E-challan Software -Online Uploading photos by the field staff -Online handheld machine tracking System -Server database and crash recovery of data. -APIs for sharing e-Challan information for online -Payment and updating of payment status in e-Challan application server.

6	Alerts/Notifications	For notification to the officers and citizens regarding any information related to civic services.
7	Complaints Redressal	Facility to provide the information to the officers received and to the citizens after redressal of the complaints e.g Complaints assigned, Complaints attended, current progress status, Complaints closed, Complaint transfer, Bookmarks-Viewed, Not viewed, Re-Open, Acknowledgement, Work in process, On hold, Resolved, No action required, Closed by Citizens, New SLA Violated. - Escalation of complaints after defined period from one level of official to next level -Notification to administrator /HoD about complaint's received, assigned, not assigned /closed

8	Zonal Officers Module	This module facilitates all the zonal officers to inspect all the civic related issues under their jurisdiction. Add task. Assigned by me to others. Bookmarks-Viewed, Not viewed, Re-Open, Acknowledgement, Work in process, on hold, Resolved, no action required, New. Draft.
9	VBD (Vector Borne Disease) Tracker	The purpose of VBD tracker would enable the officials of the health department to regulate and ensure compliance, perform inspection and enforce all the activities for prevention and control of vector & water borne diseases.
10	Rain Water Harvesting	Inspections of the building having water harvesting setup and its functionality.
11	**Specific Inspection** Public Toilet Inspection	Inspection of public toilet and status of cleanliness, functioning and Manpower deployment/contractor detail etc. Upload and referring PTU list and their details. Creation of Inspection report- selection by inspecting Officer/officials, lat long selection, image selection and submission of report. Reverting comments, Bookmarks, Violation report and draft facility. Summery Status of maintenance of PTU seen during inspection-

		GOOD FOUND CLEAN, REQUIRED IMPROVEMENT AND UNSATISFACTORY
	Parking Inspections	Inspection of parking lots and status of parking management, functioning, Parking capacity, Licenses period validity Manpower deployment/contractor detail etc which include following: Upload and referring parking lot list and their details. Creation of Inspection report- selection by inspecting Officer/officials, lat long selection, image selection and submission of report. Reverting comments, Bookmarks, Violation report and draft facility. Summery Status of management of parking lots seen during inspection - WELL MANAGED -REQUIRED IMPROVEMENT –UNSETISFACTORY -AVABILITY OF STAFF, BAY MARKING, STAFF AVAIBILITY. License Payment-Paid or Due.
12	Task Assignment	Using this module any Field officer can assign a Task to other officer, the person who has been assigned task gets notification about task being assigned, he can transfer the task to other person, he can file his compliance report with photo of

		task completed, he can send update message about status of task.
		This module will also have preventive Maintenance & Scheduler, which means any task assigned to an officer can also be assigned as repetitive task for e.g. Cleaning of NDMC statues every 15 days.
		Various field level exception reports can be generated for this module.

AWARD GIVEN TO THE TEAM NDMC BY THE HON'BLE PM

CHAPTER V

A CRITICAL EXAMINATION OF ELECTRICITY
AND PROPERTY SERVICES BY NDMC

Hon'ble Prime Minister launched Atal Mission for Rejuvenation and Urban Transformation on 01 October, 2021 with aim of making all statutory towns in the country 'water secure' and providing functional water tap connections to all households. This is proposed to be achieved through circular economy of water by effecting water source conservation, rejuvenation of water bodies and wells, recycle/ reuse of treated used water, and rainwater harvesting by involving community at large.

AMRUT 2.0 has a reform agenda, oriented towards achieving water security in ULBs and improving delivery of municipal services to the citizens. In order to encourage the ULBs to implement the reforms, AMRUT 2.0 incentivizes successful implementation of a set of reforms. For beer delivery of citizen centric services, financial health of the ULBs needs to be improved. Property tax is one of the major sources of the revenue of ULBs.

Improving coverage and efficiency of collection of property tax therefore is a mandatory reform. A substantial chunk of municipal finances is routed towards efficient delivery of water and sewerage services. These expenses ideally need to be met through collection of user charges. Therefore, streamlining user charges is also a mandatory reform. These two mandatory reforms are to implemented within two years of launch of Mission.

Mandatory Reform 1: Reform on Property Tax

Fifteenth Finance commission in its report has duly identified the need to increase property tax collection in order to improve financial health of the ULBs. Along with ensuring that an exhaustive list of properties comes under

the ambit of taxation, tax collected has to be based on prevailing guidance value/ circle rate. Milestones and eligibility criteria for property tax reform are as under:

Table 1. Mandatory Reform on Property Tax		
Milestone	**Supporting Document**	**Eligibility Criteria**
Notification of property tax floor rate which will be a function of Guidance value/ circle rate **Desirable condition:** Increase in property tax collection periodically	1) Copy of notification by State on property tax. 2) A year wise report on property tax comprising following for 2018-19, 2019-20 and 2020-21: i. Number of properties mapped ii. Number of properties against which property tax bill raised iii. Amount of property tax raised iv. Property tax collected	Issuance of notification on property tax floor rate by the State

Table 1 Mandatory Reform on Property Tax

(Source: AMRUT 2.0 Reforms Toolkit by MoHUA)

AMRUT 2.0 targets water security of ULBs and beer municipal services including water related services through reforms. To achieve this, seven reforms have been included in Mission which will be incentivised on successful implementation. Rejuvenation of water bodies, reduction in Non-Revenue Water (NRW) and reuse of treated used water are the reforms oriented towards water security of towns. Reforms on enhancing few specified services through building byelaws, efficient urban planning, online municipal services & grievance redressal system and GIS based mapping of properties are aimed at improving urban governance. Improving municipal finances through issuance of municipal bonds is also a reform which will be incentivized.

Further Incentive is proposed to be given against demonstration projects undertaken that are making remarkable impact in the fields of NRW reduction, 24X7 water supply, Drink from Tap facility, Rejuvenation of Water Bodies, SMART solutions targeting water metering in District Metered Areas (DMAs). Decision of MoHUA will be final in this regard.

Altogether, eight percent of Central Assistance (CA) allocated to AMRUT 2.0 projects as per Budget Estimate (BE) has been earmarked as reform incentive. Amount of ₹ 5,340 crore, has been broadly allocated for incentive over entire Mission period. Distribution of incentive for various reform activities is as under:

Table 2 : Amrut 2.0 Reforms to be incentivised with Timelines

Sl No	Reform to be implemented	Reform Year	Mission allocation for Incentive (₹ cr)
1	Implementation of Urban Reforms	2022-23 2023-24	650
2	Online Grievance redressal and municipal service delivery	2023-24 2024-25	350
3	Water body rejuvenation	2024-25	400
4	GIS Based mapping of properties for collection of property tax	2023-24 2024-25	400
5	Efficient urban planning through Local Area Plans (LAP) and Town Planning Schemes (TPS)	2025-26	300
6	Reduction in Non-Revenue Water (NRW) to below	2023-24 2024-25 2025-26	400

	20%		
7	**Recycle/ reuse of treated used water**	**2023-24** **2024-25** **2025-26**	**300**
	Total		**₹ 2,800 cr**

The Director of Property Tax Mr Sh. Parag Karunakar Singh provided the details of the Property Tax collection its its trend during an interview as part of the research. Same is as given below in Table :-

Till 09.02.2024

TARGET & PROPERTY TAX COLLECTION
COLLECTION REPORT

In Crores

Year	Target (RE)	ACTUAL			Total
		Private	Government	Transfer Duty	
2017-18	560.00	479.69	161.84	69.46	710.99
2018-19	665.00	421.70	181.85	34.53	638.08
2019-20	700.00	419.97	103.90	163.33	687.20
2020-21	690.00	495.34	152.65	42.79	690.78
2021-22	750.00	447.78	450.44	52.53	950.75
2022-23	950.00	666.13	214.49	50.58	931.20
2023-24 BE	1150.00	488.02	205.16	21.51	714.69
*HT Media Ltd. has deposite PDC amounting to Rs. 24.00 Cr. which will be deposited in the month of Feb and March-2024. ** amount received in NDMC treasury IUT to be created *** Transfer Duty bill processed		24.00	7.27	5.47	
Total		512.02	212.43	26.98	751.43

The Comparison of revenue received during last two years till 9th Feb-2024		PRIVATE	GOVT.	TRANSFER DUTY	TOTAL
2021-2022		386.61	102.88	33.15	522.64
2022-2023		426.76	158.58	30.60	615.94
2023-2024		512.02	212.43	26.98	751.43

Table 3: Property Tax Collection Report of NDMC from 2017 till 09 Feb 24

ELECTRICITY:

ADVANCED METERING INFRASTRUCTURE (AMI)

To Improve Electricity Supply and take step to plug leakages, New Delhi Municipal Council had taken step to complete the project of replacing thousands of conventional electricity meters with smart meters earlier and became the first distribution company in the country to implement smart metering solution, the project was aimed to further streamline the supply system.

Under this proposal, the Advanced Metering Infrastructure (AMI) service provider is responsible to integrate the data of consumer and boundary meters with infrastructure and prepare reports. So far, 63,000 Smart Meters have been installed to the premises of consumers.

The project has been implemented by the Energy Efficiency Services Limited (EESL) and as per MoU, EESL has funded, build, operates and manage the Smart Metering (AMI) Solution implemented in the NDMC area. EESL has selected a System Integrator to implement the Smart Metering (AMI) Solution and integrating it with NDMC IT legacy applications. NDMC has been benefitted from enhanced consumer satisfaction level resulting from better complaint management, faster restoration of outages, and awareness of optimized consumption pattern, and improvement in system stability, reliability and transparency. **There is no need for meter readers to visit each household** as the GPRS technology help the Council to control the system and reading the bill Units and other requisite parameters for the billing needs.

"**The system allows the consumers to know their consumption on a real-time basis and accordingly in their homes**, leading to reduced power wastage and providing long term carbon and financial savings. They can find out the quality of power supply, which help them to save their appliances from tripping. The project will help the civic agency to regulate electricity consumption by identifying defaulters using more than the sanctioned load.

NMDC's large-scale adoption of smart meters is a significant measure towards future-ready technologies. Smart meters pave the way for the smart grid as they enable two-way real-time communication between Discoms and consumers through GPRS technology. Smart meter data can ensure faster outage detection and swift restoration of service. Implementing smart meters is one of the operational performance parameters under the Government of India's Ujwal DISCOM Assurance Yojana (UDAY). The scheme helps in reducing AT&C losses. It also helps in monitoring of round the clock power supply eventually leading to greater efficiency and offers a pathway to meeting the government's vision of 24X7 Power for all.

WHY SMART METERS

- Easy consumption monitoring on real time basis.
- Enable consumers to adjust their power consumption pattern in order to lower electricity bills.
- Eliminates manual monthly meter readings.
- Net Meter ready - No need of an additional meter for measuring energy from solar panel.
- Monitors the electricity distribution system much more quickly.
- Makes it possible to use power resources more efficiently.
- Provides real-time data that is useful for balancing electric loads while reducing power outages (i.e., blackouts).
- Early meter failure detection.
- Accommodating faster service restoration.
- Possible to extend time-based power option.
- Saves money and manage energy consumption.
- Monitoring of energy usage and an overall visibility on energy consumption.
- User friendly Smart Meter Mobile Application.
- Web Portal with wider features to connect.
- Helpdesk: 24x7 to provide Customer Services.
- Enhanced transparency and accessibility.

MOBILE APPLICATION

Mobile Application aims in improving customer services by providing basic required features for consumers on their fingertips Functionalities available in Mobile Application:

- My Profile.

- Consumption Pattern.

- Complaints.

- View and Pay Bill.

- On Demand Read.

- Demand Violation.

- FAQ

- Energy Saving Tips.

- Contact Us.

BENEFITS TO NDMC

- Real time energy accounting thereby reduction in Aggregate

Technical & Commercial (AT&C) losses.

- Reduction in manpower cost.

- Reduction in peak power purchase cost.

- Reduction in cost of connection/ disconnection.

- Faster detection of outages and defective meters.

- Identification of phase imbalance.

- Reduction in human errors for meter reading.

BENEFITS TO CONSUMERS & SOCIETY

- Accurate bills.

- Faster restoration in case of outages.

- Savings on electricity bills via Time of Use (ToU) tariffs.

- Greater control of electricity consumption and options to save money.

- Reduction in carbon footprint.

- Platform for other Value-Added Services.

- Tariff-neutral system upgrade.

WEB PORTAL

Web Portal have the following landing page with the following features:

- New User Registration/Sign IN,
- Login to My Account.
- User can update profile, change password, Subscribe/Unsubscribe SMS/Email bill etc.
- Bill/Consumption/Payment History.
- Bill Information ¬ Bill Summary.
- Pay Bill

INTERVIEW

There were interviews taken as part of the research with officials and citizens of NDMC. To facilitate the same at NDMC, a letter signed by the DG, IIPA was sent to Chairman, NDMC and copy of the same is placed at **Appendix 'A'**. Having made a visit to the Chairman's office and interacting with him, multiple interactions were carried out with the Directors/Jt Directors of the concerned departments to gain more insight. There was a WhatsApp group made with all RWA presidents and Secretaries under NDMC area and they were sent a Google Form to interact and get direct opinion from the residents on the 311 App so as to collect primary data needed for the research. The list of people interacted with in NDMC and otherwise for the research are as under:-

- Amit Yadav, IAS, Chairperson and Member, NDMC

- Smt. Anjum Siddiqui, Dir Coordination, Skill Development and Training.

- **Shri Dharmender Singh**, IAS, Chief Secy of Arunachal Pradesh, Erstwhile Chairman, NDMC - Interview was done in detail and is placed at **Appendix 'B'**

- **Shri DP Singh**, Spl Secy MOUD, UP,
  Erstwhile Dir IT at NDMC - Interview was done in detail and is placed at **Appendix 'C'**

- **Ms Kritika Choudhary**, Dir Information Technology – Interview was done in detail and is placed at **Appendix 'D'**

- **Sh. Parag Karunakar Singh**, Spl Dir Projects and Property Tax – Data in regards to property Tax was directly collected from him.

- **Asst Engg Dinesh Tiwari**, ICCC, NDMC

- **Mr AW Ansari**, Jt Dir Commercial - Interview was done in detail and is placed at **Appendix 'E'**

- **Mr Raj Kamal Singh**, Senior IT programmer - Interview was done in detail and is placed at **Appendix 'F'** and video interview was also taken with him.

- **Shri Gauri Shanker Agrawal** SE, ICCC, NDMC - - Interview was done in detail and is placed at **Appendix 'G'**

- **Mr Bhawani Shankar Singh**, Programmer IT

- **Mr Dinesh Aggrawal**, Dir IT event

- Telecon with many RWA presidents and Secy (present and retired)

- Telecon with RWA residents

- Field visit in the NDMC area – Photos (whenever allowed by citizens) placed as Exhibit 'P' which depicted geotagged Marked Building numbers.

It was very evident from the excerpts of the Interview conducted with NDMC officials that were many challenges from the very beginning to implement the scheme. In the words of the erstwhile Chairman, Mr Dharmendra "Challenges for any shift to online services starts with digitisation of data and thereafter the resistance to change comes from the people who are implementing these services. Resistance from employees can be managed by educating about the details of the scheme including how it will facilitate and benefit them and also provide the assured convenient service to the public. After this it is only the actual implementation that is lo be managed." He added that the application was made user friendly and expandable so that more services can be added with time. Initially 49 services were made online for public and 11 services for NDMC employees as per him.

As per the incharge of ICCC, NDMC, Mr Gauri Shanker, there was a lot of integration required towards integrating the 30-40 applications. He adds that for Integration of any service with ICCC firstly, it had to be digitised and application to be developed. Aslo, for implementation of one application in single department, a lot of process flow gathering, modification in process and development and testing of application and thereafter monitoring of day to day operations was a requirement that had been achieved. As per Mr Ansari, erstwhile Jt Dir IT, the 311 App is a refined App with processes and protocols incorporated with adequate security measures having data placed on cloud with security audit from the certified firms as per MEITY guidelines being carried out.

CHAPTER VI

IMPACT ASSESSMENT

As a frontrunner in the Prime Minister's Smart City Mission, and with the responsibility of the top bureaucratic area of the country, New Delhi Municipal Council (NDMC) has taken a host of initiatives to augment and optimize Citizen Delivery initiatives that are under its purview. Implementing solutions such as digitalization and rendering 40+ services online, Digital Mobile based interface both for the citizens and for monitoring of quality of services, as well as 24x7 monitoring of services through ICCC, NDMC ensures that technology is kept at the forefront of citizen delivery. These initiatives ensure a transparent, accountable and effective citizen interface. The services offered by the 311 App are :-

Govt to Citizen (G2C)

- **Online Birth / Death Certificate**
- **Online Payment of Utility Bills**
- **Online Name Inclusion for New Born**
- **Online Barat Ghar / Venue Booking**
- **LoveMyTree: QR Code on Tree**
- **UMANG**
- **Online Medical Store – Stock Monitoring**
- **E-Hospital**
- **Online Inoculation Slot Booking (Yellow Fever Vaccination)**
- **Property Tax**
- **E-Waste**

Government to Businesses (G2B)

- **Building Plan Approval**

- **Online Mutation of Property**
- **Online Health Trade License**
- **Bill Tracking System (Vendor Payment Tracking)**
- **Online Road cutting permission**

Government to Employee (G2E)

- **Pensioner Portal**
- **Pay-slip / Form 16 / GPF / Pay-slip etc.**
- **Online Vigilance NOC**
- **GIS Mapping**

Short-Term Applications as per requirements

- **Yoga Day Registration**
- **Swachh Survekshan Pledge**
- **Swacha Survekshan Survey**
- **School Admission   Registration**
- **Online JR/SR Doctor Vacancy**

Without the use of technology, the municipality used to suffer from a slew of issues including lack of transparency, ineffective governance and poor accountability of resident grievances. This issue was faced across all the departments of NDMC and therefore a need was felt to put in place a system where the resident is empowered to demand his public services in a transparent and efficient manner. For the purpose of achieving this, we have identified all the services that are extended by various departments and formulated a plan to extend the same without any human intervention. In this, educating users and various internal departments has proved beneficial to those who have understood technology initiatives to derive use cases for themselves in e-Hospitals, Utility Payments, Building Plan Approval, GIS, Garbage Disposal, Digital Door Numbering, Resident grievances through NDMC-311, Smart Bins and Smart Meters. Active participation of departments who have been given various presentations on technology offering of NDMC have developed in co-

developing use cases and solutions. Investment in upskilling has given dividends and is a best practice.

Figure 3: Display interface of 311 App on mobile
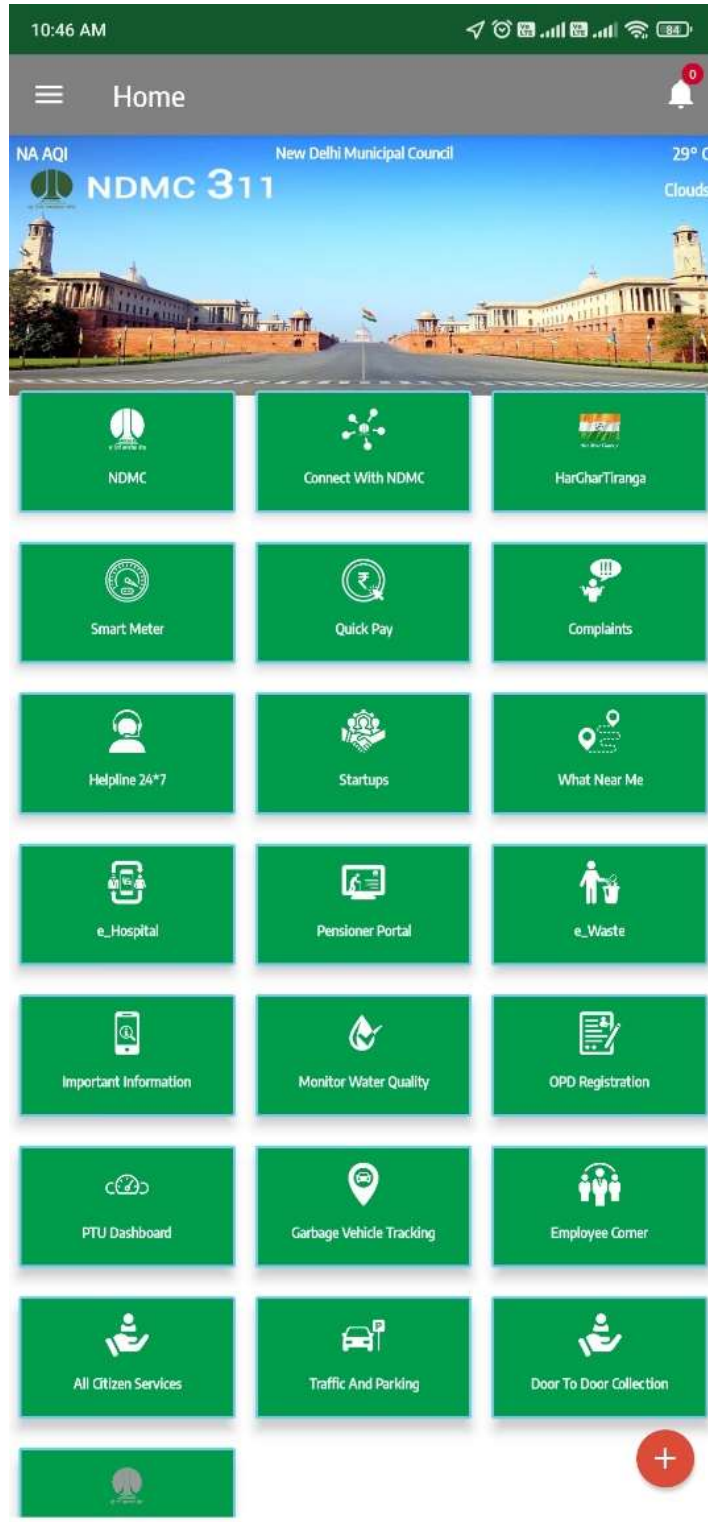
Innovations around Seamless Delivery and Impact

NDMC's seamless, touchless and faceless mechanism for end-to-end service delivery is extended for various services. These have been built with focus on ease of citizen delivery end to end, in order to enable a transparent, accountable and effective citizen interface.

Online Certificates include Online Birth & Death Certificates. These have inbuilt QR Code and are integrated with Blockchain for enhancing trust, transparency and verifiability of documents. **The turnaround time for getting the certificates got reduced by 99%, from 7-10 days before online service was implemented to less than 5 minutes now**.

Earlier the Health Department used to rely on past data about where insecticides should be sprayed most for fighting chikungunya and used a standard template of spraying all locations / drains to fight the diseases. There were several instances where hotspots of mosquito proliferation used to get created thereby leading to a lot of cases of chikungunya, Malaria etc. Using GIS and the complaint logs from the NDMC-311 App, we plotted heatmaps of places from where cases of chikungunya were most found to come up with a list of most prone areas. With this analysis, preemptive steps to increase insecticide spraying to avoid hotspots were taken resulting in fewer cases of chikungunya in the succeeding years. The same concept was also extended to identify areas where the issue of waterlogging cropped up most and using past data for the succeeding years for desilting, upgrading sewerage systems. GIS also helped in better city planning as, till now planners used to rely on outdated physical maps, with incorrect pictures of city infrastructure causing mismanagement and a lot of back and forth in planning, which got solved with digitized maps and infrastructure planning using GIS.

NDMC has also implemented **Digital Door Numbering** across all the commercial and residential complexes in its area. Every household, shop, commercial establishment has been assigned a unique address, door number which has an RFID tag attached to the Digital Door Number. Whenever the garbage pickup van passes these Digital Door Numbers (NDDN), the RFID reader on the vans scans these tags. This helps NDMC in finding out which areas in the NDMC area have been cleaned by the pickup truck, thus helping in effective governance.

Picture of an RFID Tag Digital Door Number

NDMC has also implemented **Smart Bins** as a project, wherein the Garbage bins are monitored. The garbage bins are graded to identify the level of capacity usage from 0% full to 100% full. As the garbage bin fill rate approaches 80-90%+, the ICCC agent will assign a ticket for the sanitation department to clear the garbage in the respective location. This ensures proper waste disposal and garbage management in the city.

NDMC is a pioneer in implementing **e-Waste Collections** from Residents/ Government & Private offices in the NDMC Area. Improper disposal of e-Waste is harmful to the environment because of the radiations emitted and the hazardous chemicals used. This proper disposal saves residents from said hazards

Transparent & Efficient Transaction: Customers can avail the facility by selling e-Waste, including computers, mobile phones, Air conditioners, Fridge, and Cables etc., on NDMC approved rates using m-application. Real Time electronic transfer of funds to the customer on collection of e-Waste No lower limit on the number of eWaste items to be disposed Customer Dashboard to gives update to the resident (Collection Date, Reimbursement)

Complaint Management: The success of NDMC as a Smart City relies on resident satisfaction and the efficiency with which his/her issues at the municipality / city level are solved. For this there are 2 mechanisms that NDMC leverages for problem management.

The first workflow is through the NDMC 311 Application, which is extended to both the residents as well as the Officers in the NDMC area. The resident can simply click and post a picture of the issue he is facing and log a complaint to the relevant department of NDMC. The same is also geo-tagged for effective redressal of issues. The ticket is then auto assigned to an agent of NDMC's concerned department. The ticket is solved by the agent and the status is updated on the NDMC 311 application. Managing officers can see dashboards of the issues which are addressed and also monitor efficiency.

The second workflow is the NDMC Integrated Command and Control Center (ICCC), which gets data from 80,000+ sensors in the city. The issues related to customer grievances, smart meters, garbage disposal, air quality, GIS and many others are monitored and solved with the ICCC interface.

The Intergated Command and Control center (ICCC) has over period from 1st April 2019 to 31st December 2021 received 69K complaints for Online Services in total and the disposition rate for the same is equal to greater

than 98%. The resident also has the option to log his complaint using the NDMC 311 app. In the past received 69,907 complaints and disposed of 69K+ complaints.

Smart Meters have been integrated to handle issues in the earlier system which included pilferages of Electricity due to non-real time monitoring of meters, increasing BAD debt (poor collection efficiency), high AT&C losses, customer complaints of incorrect billing. With 2-way communication through GPRS and transparency of usage through NDMC 311 application, NDMC has managed to reduce AT&C losses from around 15% in 2016-2017 to 10.4% in 2020-21. Also, the collection efficiency has gone up from around 97% in 2016-2017 to 99% in 2020-21. The same has approximately brought rupee benefit worth Rs 12 Cr+ every year and reduced wasteful spending of the Exchequer. Citizens further benefit from real time dashboarding of their usage patterns through the NDMC 311 Application.

Some of NDMC key initiatives& their impact taken in providing seamless delivery of services without human interventions are: -

Municipal Services and Grievance Redressal through NDMC 311 Mobile App

NDMC has implemented mobile App NDMC 311 to resolve citizens' complaints and grievances in an efficient and transparent manner. Through this App, citizens are filing their grievances/ complaints pertaining to water, electricity, sanitation, sewerage etc. and are getting real time updates about resolution of their grievances.

<u>Outcome</u>

Citizen engagement has been enhanced. Footfall on citizen facilitation centre has also been drastically reduced up to 65% to 70%. NDMC Citizen Services

never affected during pandemic COVID situation. Approx. 1,50,000 complaints have been received & 99%+ complaints have been resolved.

Implementation of Geographic Information System (GIS)

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyse, manage and present spatial or geographic data. For visualization and better planning of services, NDMC launched GIS portal with 256 layers of different services. One can easily locate a Public Toilet, Clinics/ Dispensaries, Litterbins, Metro Stations, Police Stations, Pharmacies, ATMs etc.

Outcome

Helping in Smart Planning to build citizen centric infrastructure like public toilet units. By using GIS Map & complaint received on App311, heat maps are being generated to find out the venerable area for vector borne disease like dengue &chikungunya. With this analysis, pre-emptive steps are taken to increase insecticide spraying to avoid hotspots resulting in fewer cases of chikungunya& dengue in the succeeding years.

Online application of birth and death services

This service with in-built QR Code has been implemented free of cost, Further, inclusion of name in birth certificate after authentication of details using Aadhar details has also been started online to facilitate citizens. Approx. 6 Lac plus birth & death certificates have been issued through online system.

Outcome

The turnaround time for getting the certificates got reduced by 99%, from 7-10 days before online service was implemented to real time basis.

Online Booking

The booking of NDMC Barat Ghars, water tankers, Community Centres, and different NDMC venues for Public Events has been made online.

<u>Outcome</u>

Hassle free online registration without coming to NDMC facility centre physically. Till date 2061 consumers have been availed this facility.

Online applications for electricity and water connections

The process of applying for electricity and water connections in NDMC has been digitised with definite timelines within which the departments concerned to grant sanctions to citizens applying for these services. This project has been designed to ease the application process and to prevent the citizen from having to run from pillar to post.

<u>Outcome</u>

Physical interactions with site engineers have been eliminated.

Online Payment Facilities

As a part of Digital India Initiative of Government of India, NDMC has implemented various modes of online payment system like UPI, BHIM enabled Bharat QR, BBPS, NEFT/RTGS and Debit/Credit Cards.

<u>Outcome</u>

Hassle free online payment. Enhancement of transparency.

Some other key initiatives taken for improvement in citizen service delivery: -

Integrated Command and Control System (ICCC)

As nodal point of availability of all online data and information related to online Services Integrated Command & Control Centre (ICCC), at Head Quarter Building, Palika Kendra has been established This state of the art and first of its kind ICCC integrates twenty municipal services, LED Smart Lighting, Solid Waste Management, Air Quality Sensors, Smart Parking system, Birth & Death, GPS for NDMC Vehicles, LED Screens, Public Wi-Fi, Building Plan Approval, Smart Electric Meter, Electricity Billing, E-Hospital, STP, Event Management and grievance redressal among others. This has brought in a paradigm change in delivery of citizen services.

Outcome

Better management of all services, The ICCC w.e.f 1st April 2019 to 31st December 2021 has received 69K complaints regarding online services in total and the disposed rate for the same is equal to 98%+.

Snapshot during visit to Integrated Command and Control Center at NDMC

Smart Energy Meters

With the installation of smart energy meters Citizen can see their consumption report on day to day basis which are helping them to set their horizon or energy consumption.

Outcome

NDMC has managed to reduce AT&C losses from around 13.4% in 2016-2017 to 10.4% in 2020-21. Also, the collection efficiency has gone up from around 97% in 2016-2017 to 99% in 2020-21.

Smart Bins

NDMC has also implemented Smart Bins as a project, wherein the Garbage bins are monitored. The garbage bins are graded to identify the level of capacity usage from 0% full to 100% full. As the garbage bin fill rate approaches 80-90%+, the ICCC agent will assign a ticket for the sanitation department to clear the garbage in the respective location. This ensures proper waste disposal and garbage management in the city.

Outcome

Environmentally friendly. Timely collection of garbage. Important in achieving the Swachh Survekshan goal.

Digitization is one of the determining factors in restoring public trust and in increasing transparency. "E-government which is the outcome of digitisation is a great tool to improve public management and to ensure transparency, traceability and reduce corruption." These digital technologies can help governments to understand their citizens better and provide services more effectively and efficiently in a transparent way and find new solutions to policy challenges.

It is due to the digitisation and efficiency of service availability through 311 App that the Corporation has had to shut down many Customer Facilitation Centres (CFCs) due to lack of customers coming to the centres for lodging their complains with the easy facility of the same being available to them through the 311 App. The following table shows the numbers of centres closed by the New Delhi Municipal Corporation after the online launch of the 311 App. The footfall at the other CFCs is also very less and they may follow suit in the coming times.

Table 4: CFC Centre Status

Sr. No.	CFC Centres before Online Implementation	CFC Centres after Online Implementation
1	Mandir Marg Headquarter	Mandir Marg Headquarter
2	SBS Place Gole Market	SBS Place Gole Market
3	Sarojini Nagar	Sarojini Nagar
4	CPH	CPH
5	PMH	PMH
6	Kidwai Nagar	Closed
7	Kaka Nagar	Closed
8	Babar Road	Closed
9	R K Puram	Closed

With the facility of getting the birth and death certificate online through the 311 App there has been a significant reduction in the numbers of Certificate printing in offline, mode restricted to some complicated cases or with citizens who are not very tech savvy (Esp. in the older generation).

The data of Online certificate printing from Jan 2021 to 14 Feb 2024 is indicated in the table below: -

Table 5: Data of Online Printing of Birth Certificates

Certificate Printing Report from Jan 2021 to 14 Feb 2024							
	Online Printing				Offline (Counter Printing)		
Year	Birth	Still Birth	Death		Birth	Still Birth	Death
2024	18861	0	8756		3163	0	656
2023	155172	15	56526		28099	4	5580
2022	148647	14	48994		31715	22	6572
2021	99923	9	42567		33474	0	9566
Total	422603	38	156843		96451	26	22374

The data of grievances and complaints that were received by the NDMC and those which have been resolved through the online mechanism which can also be tracked real time with the help of 311 App in the Officers edition is as indicated in the table below from the period of 2021 to 2023:-

Table 6: Data of grievances and complaints Received and Resolved

Data of NDMC 311 app for the year from 2021 to 2023			
Year	Received	Resolved	Pending
2021	25977	25973	4
2022	41359	41301	58
2023	39774	39380	394.00

Table 7: DATA OF ELECTRICITY REVENUE GENERATION THROUGH BILLS COLLECTION

TARGET & ACHIEVEMENTS

All figures in Rs. Crore

FINANCIAL YEAR	TARGET	ACHIEVEMENTS
2014-2015	1260.00	1303.35
2015-2016	1352.81	1380.39
2016-2017	1375.00	1383.00
2017-2018	1456.00	1406.72
2018-2019	1536.00	1554.75
2019-2020	1656.00	1585.00
2020-2021	1455.00	1394.33
2021-2022	1510.04	1513.17
2022-2023	1661.00	1696.39

Table 8: DATA OF ELECTRICITY REVENUE TREND

REVENUE REALIZATION TREND AGAINST ELECTRICITY & WATER BILLS FROM FY 2014-15 TO FY 2022-23

Financial Year	Water	Electricity
2014-15	163.43	1120.52
2015-16	204.91	1225.17
2016-17	233.49	1150.87
2017-18	235.48	1171.11
2018-19	228.41	1323.96
2019-20	227.04	1335.08
2020-21	253.33	1141.00
2021-22	250.97	1262.20
2022-23	240.50	1455.89
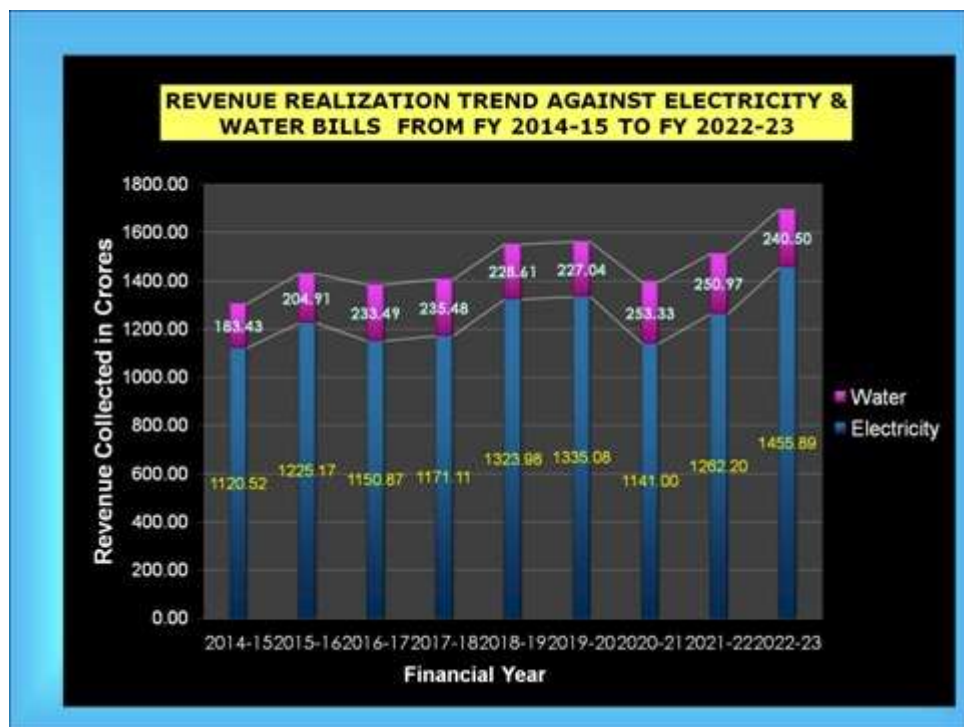
A survey was also carried out from the citizens to find out the actuals things about the digital transformation and the impact it had generated. The survey was done from within the entire NDMC area as numbers from the 311 App database were picked up and mostly RWA presidents and secretaries were approached to request the residents of their AoR to answer the Google survey. The response was very less as only 57 responded mainly due to the fact that their email and names had been sought as a mandatory requirement in the survey wich most officers also hesitated. The questionnaire is attached at Appendix 'H'. The number of online users of the App have been increasing every year by a visible trend as depicted below in Figure 4:-
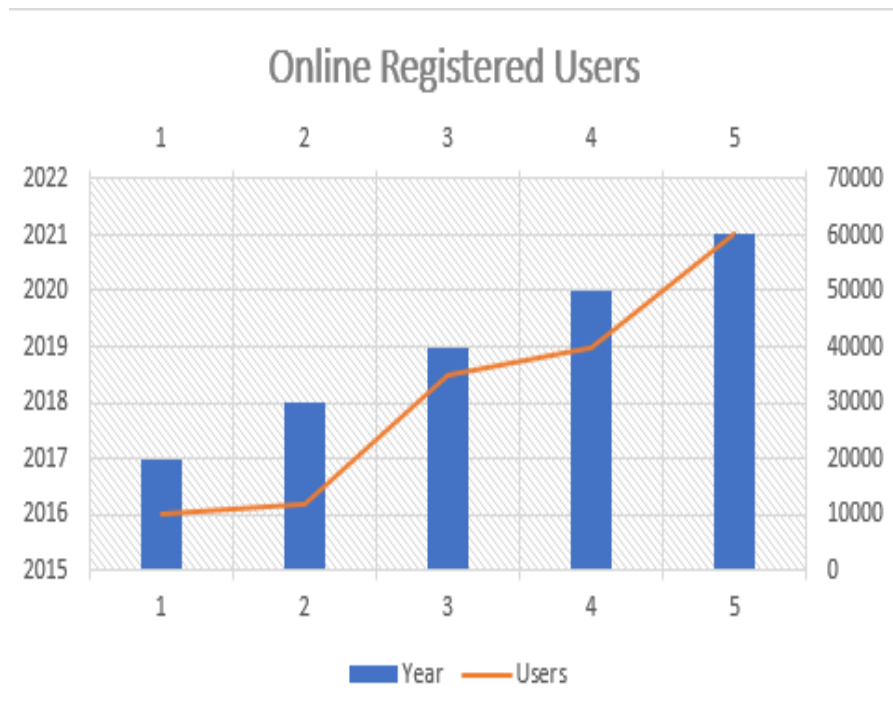
Figure 4: Online users of Apps Data over years

(Source: NDMC IT Database)

The Figure 5 below depicts answer to the question *'Are you aware of 311 App and online service delivery website/platform of NDMC, the digital platform for government services in NDMC area of New Delhi?'* wherein 54.4% were aware and knew how to use the App while many wanted greater publicity and while during the manual survey it was observed that most officers in the government departments have PA's and secretarial staff and prefer manual complain and therefore had not being using the App:-
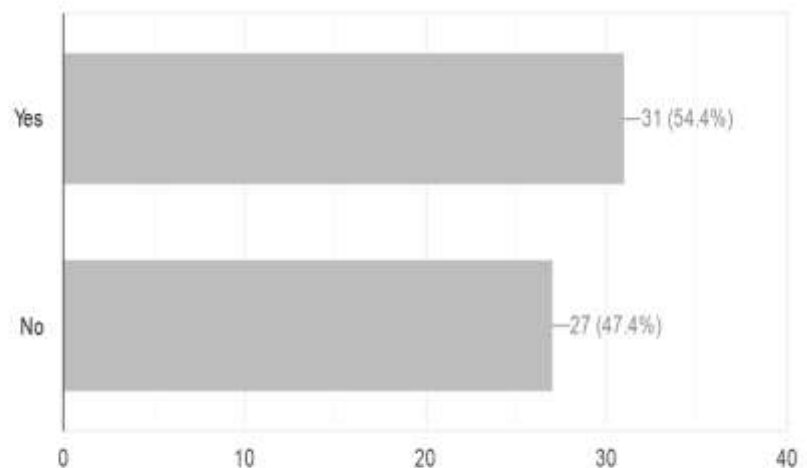
Figure 5: Awareness Survey of 311 App

The Figure 6 below depicts response to if the citizen had used the APP and its easy of use, with 66.66 % were satisfied to highly satisfied:-

If you have used the same, please rate your experience in terms of ease of its use and accessibility (ease of finding and accessing services)
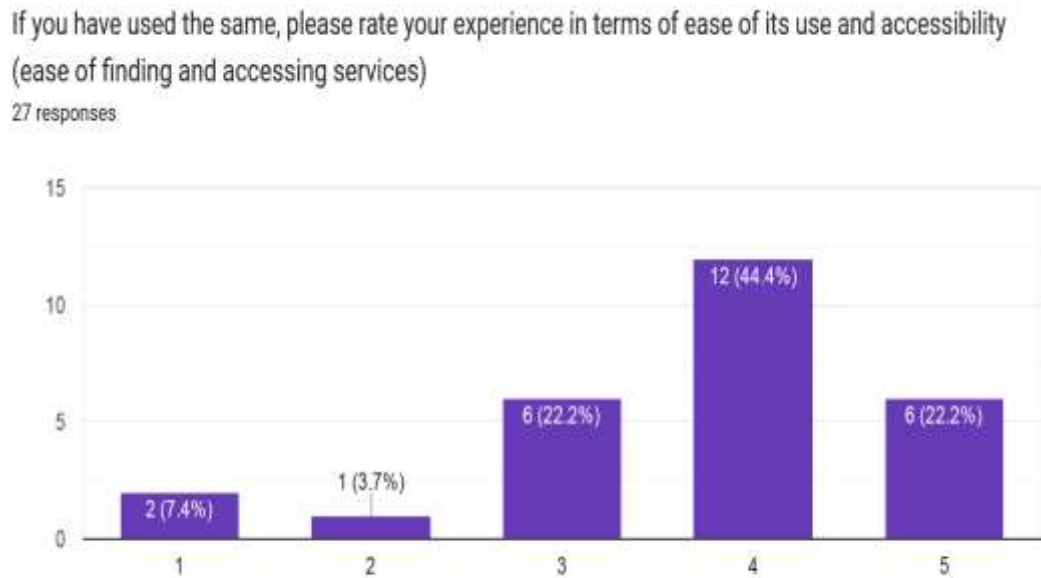
27 responses

Figure 6: Ease of use of 311 App

The Figure 7 below depicts type of service used by the respondents:-
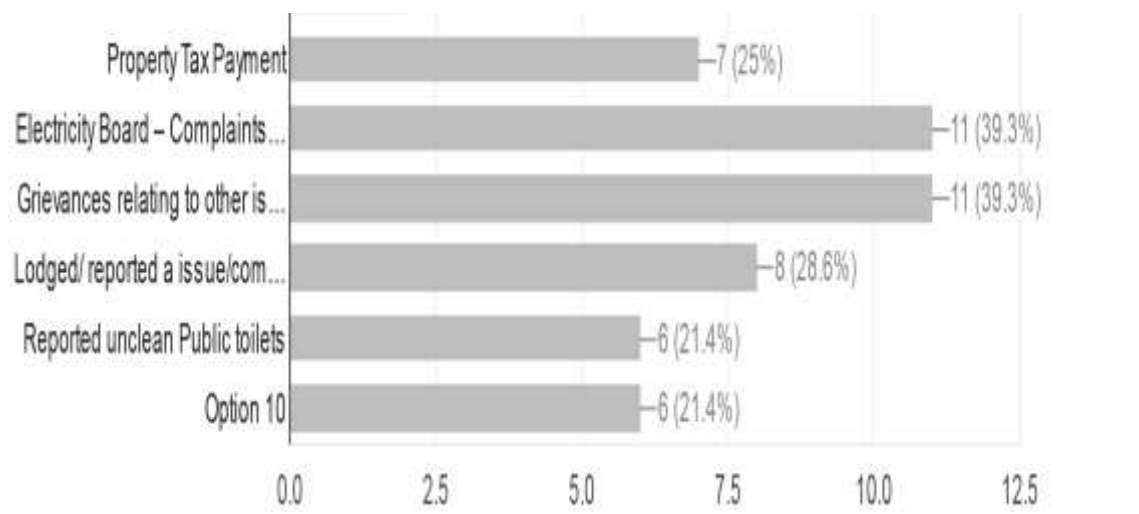
Figure 7: Type of service used by the respondents

The Figure 8 below depicts response to the question *'Compared to older manual complaint/traditional offline methods, did you find online app easy or more convenient for accessing government services?'* by respondents where one can see 81.8 % responded that the online mode was better/more convenient to use for services : -

Compared to older manual complaint/traditional offline methods, did you find online app easy or more convenient for accessing government services?
33 responses
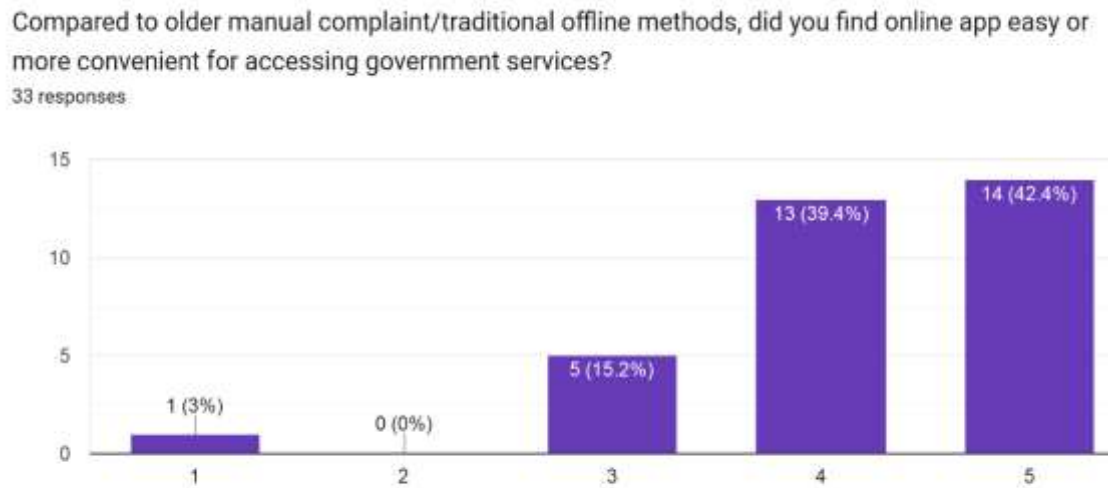
Figure 8: Data on Online App being preferred over manual mode

The Figure 9 below depicts response to the question '*Please rate your overall satisfaction with the services provided through 311 app of NDMC // 311 APP sey aap kita satisfied hain?*' wherein one can observe that 90 % are satisfied to highly satisfied with the App performance:-

Please rate your overall satisfaction with the services provided through 311 app of NDMC // 311 APP sey aap kita satisfied hain?

30 responses
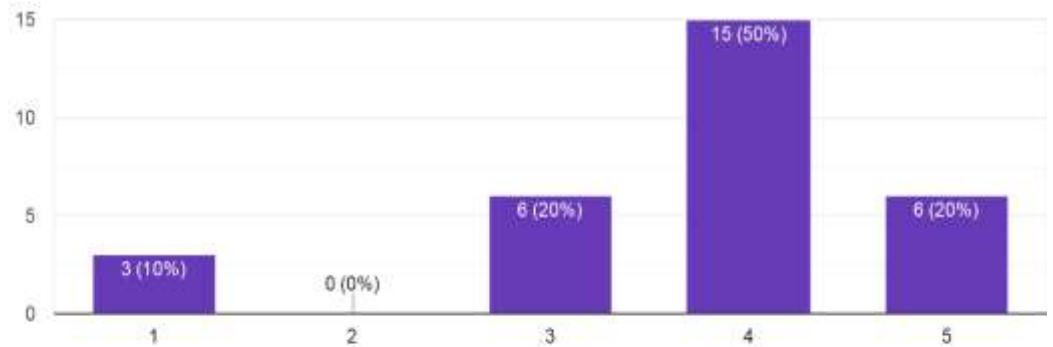
Figure 9: Satisfaction level of 311 App Users

The Figure 10 below depicts response to the question '*To what extent as per you the 311 app of NDMC has become successful in getting public services? '* wherein one can observe that 83% are able to get successfully the services from the App:-
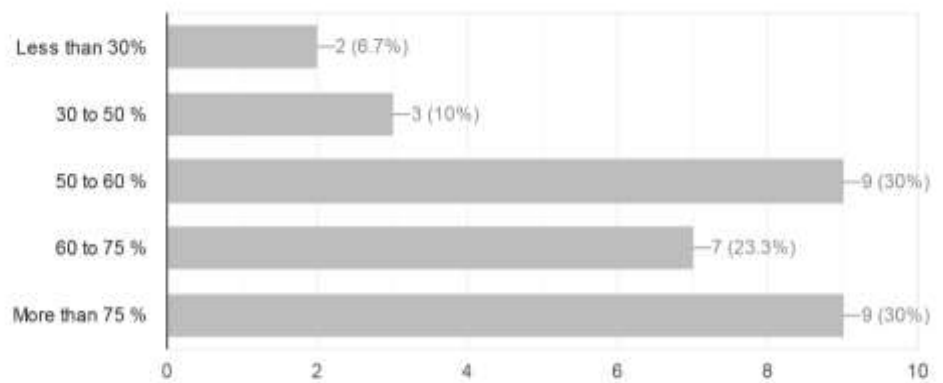
Figure 10: Success level of Service delivery by 311 App

The Figure 11 below depicts response to the question '*How would you rate the responsiveness of 311 app of NDMC in addressing your service requests or queries?*' wherein one can observe that more than 63.4 % have rated the responsiveness as better than 'good' with 26 % being neutral :-

How would you rate the responsiveness of 311 app of NDMC in addressing your service requests or queries? // 311 APP ko aap kitna prabhavi manneygey public service ko aasan bananey key liyea?
30 responses
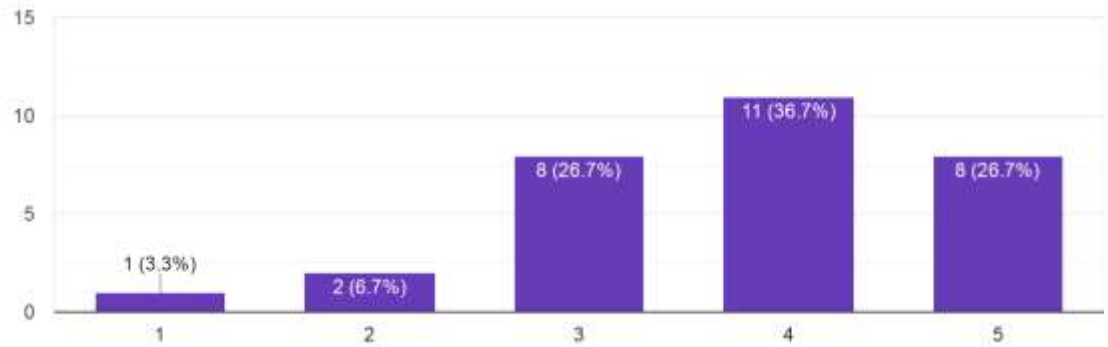
Figure 11: Responsiveness level of Service delivery by 311 App

The Figure 12 below depicts response to the question *'Please rate your satisfaction with the following aspects of using 311 app of NDMC services on a scale of 1 to 5 (1 being and 5 being very satisfied)'* wherein one can observe that the satisfaction level has been good or better with almost 61.3% respondents:-
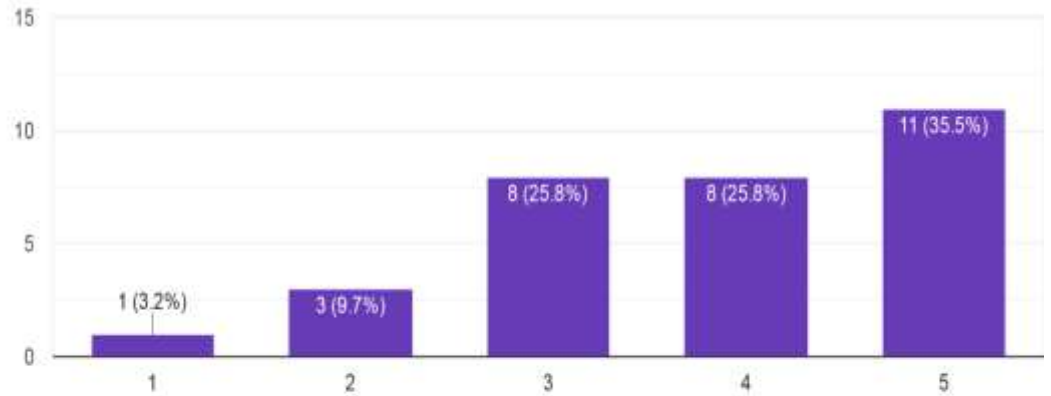
Figure 12: User Satisfaction level in using Services through 311 App

The Figure 13 below depicts response to the question ' *Ease of use of App*" to which there has been as 71% have expressed satisfied to highly satisfied:-
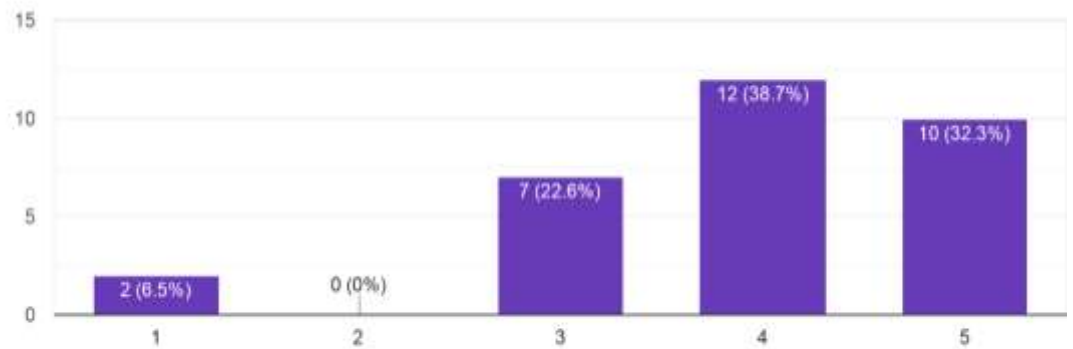
Figure 13: Ease of using 311 App as per Users

The Figure 14 below depicts response to the question '*What is the response time for deliver of the service requested by you?'*, almost 58.6 % expressed it had been good with 31 % being neutral :-
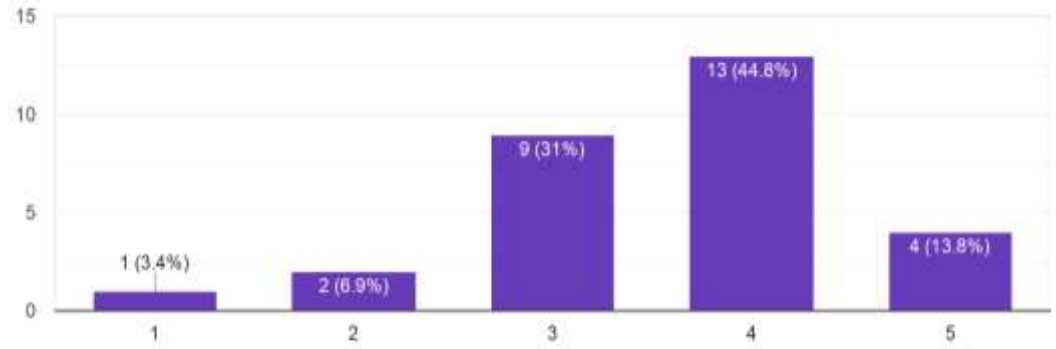
Figure 14: Timely delivery of services through 311 App as per Users

The Figure 14 below depicts response to the question '*Clarity of information provided by the 311 APP'*, 64.5 % respondents expressed that the information was better than good, with 25.8% being just ok with the information provided through the App :-
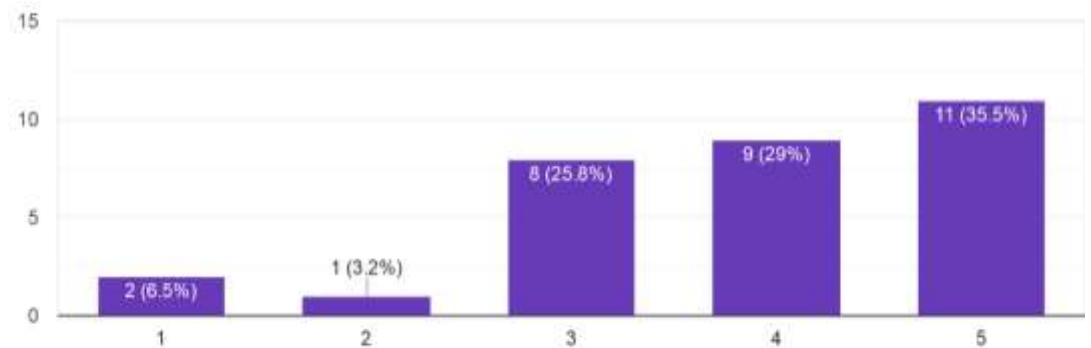
Figure 15: Information clarity through 311 App as per Users

The Figure 16below depicts response to the question *'Overall service quality through 311 APP',* wherein 64.5 % were satisfied to highly satisfied with the

overall service through the App:-
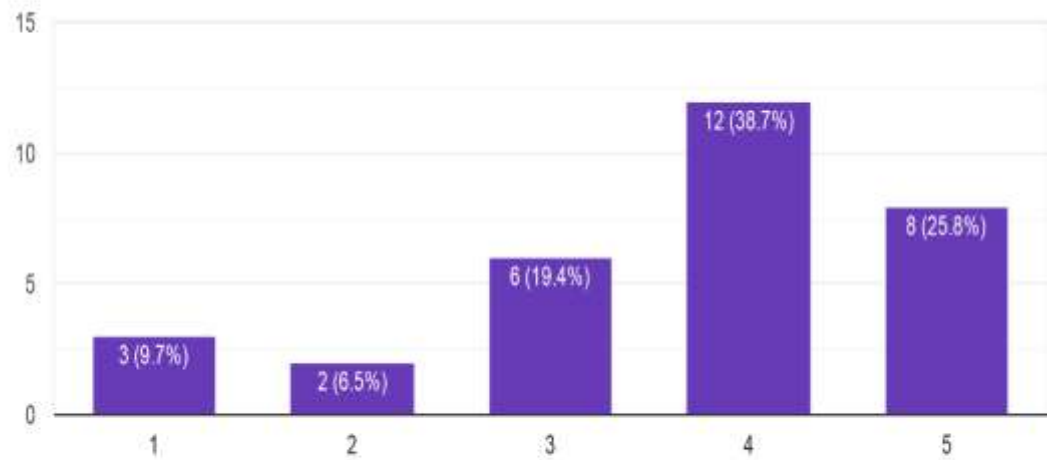
Figure 16: Overall service quality through 311 APP as per Users

The Figure 17 below depicts response to the question '*Have you encountered any technical issues or challenges while using 311 APP of NDMC? (e.g., website errors, login problems)*' wherein 69 % have replied that they have not faced any issues and 34.5% have faced some technical issues or problems:-

Have you encountered any technical issues or challenges while using 311 APP of NDMC? (e.g., website errors, login problems) // 311 APP istmal kartey waqt koi samasya aapney face kari hai??
0 / 29 correct responses
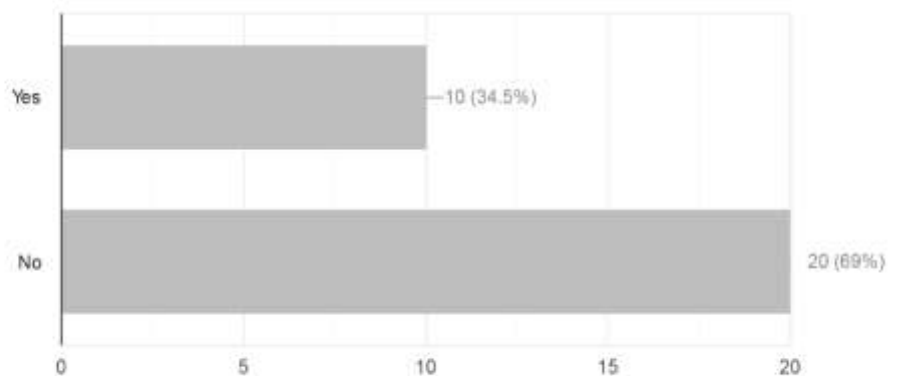
Figure 17: If any users had faced tech/other issues using 311App

The Figure 18 below depicts response to the question *'Do you want the 311 APP to be in more languages like Hindi/Punjabi etc.'* , wherein 81.6% responded that they wanted it to be in other languages as well:-
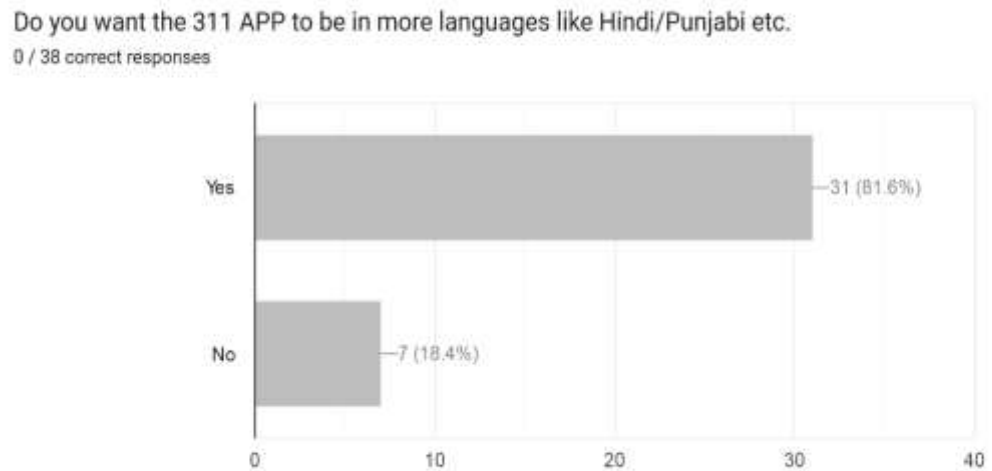
Figure 18: If users wanted 311 App to be Multilingual

The Figure 19 below depicts response to the question *'Do you think all Government services be provided in Digital/ On-line mode ?'* wherein 93.2% respondents wanted that the government services to be provided in the online or digital mode supporting the fact that no one in this modern digital age wants to stand in line for services and would prefer online delivery of public services to doorstep which will be a major change all the governments at all levels will have to undergo towards good governance and citizen satisfaction:-
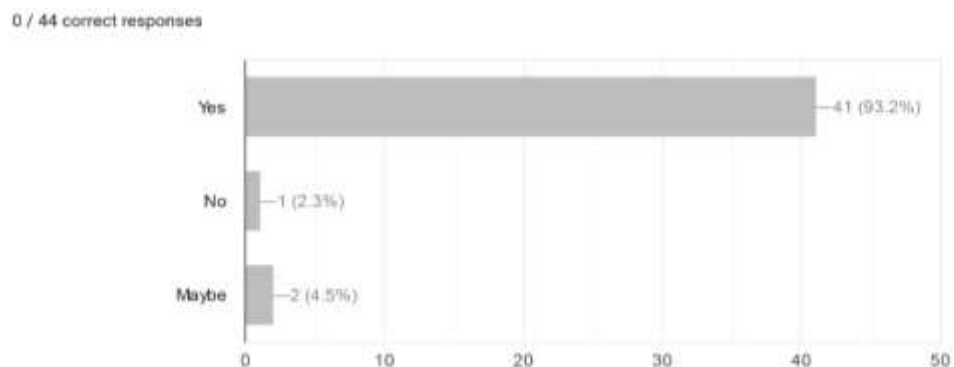
Figure 19: Should Govt Services be provided in Online mode

The Citizen through their feedback have given towards the positive as can be seen from the screenshots from the 311 Officer App below:-

23.
Name: kumar bablu
Email: blupandit1985@gmail.com
Department: Horticulture Department
Created at: Sep 16, 2022 08:20:22 PM
Feedback: Good job I am satisfied

25.
Name: Vipin Sharma
Email: romysharma.rs@gmail.com
Department: Horticulture Department
Created at: Sep 16, 2022 10:41:36 AM
Feedback: Few days back i had given a complaint regarding destroying of park by doing activities which are prohibited in these park..i am taking about Ayappa Park Hari Enclave..the condition of park was like hell & not in the good condition after. Lodge complaint & action taken by the authorit . Now it is ok

64.
Name: Javed Sehgal
Email: javedsehgal003@gmail.com
Department: Public Health Department
Created at: Sep 01, 2022 08:53:20 PM
Feedback: Public health department NDMC me No 1 hai very very good job sweeping ? cleaning best ?

6.
Name: Civilian Amit
Email: amitamit30914@gmail.com
Department: CIVIL ENGINEERING DEPARTMENT-II
Created at: Sep 22, 2022 01:06:26 PM
Feedback: Humari comments thik ho chuki hai thankyou NDMC

The Figure 20 below denote the number of offline and online transaction comparision. This clearly indicates the huge increase of online transaction from manual after the deployment services of the 311 App
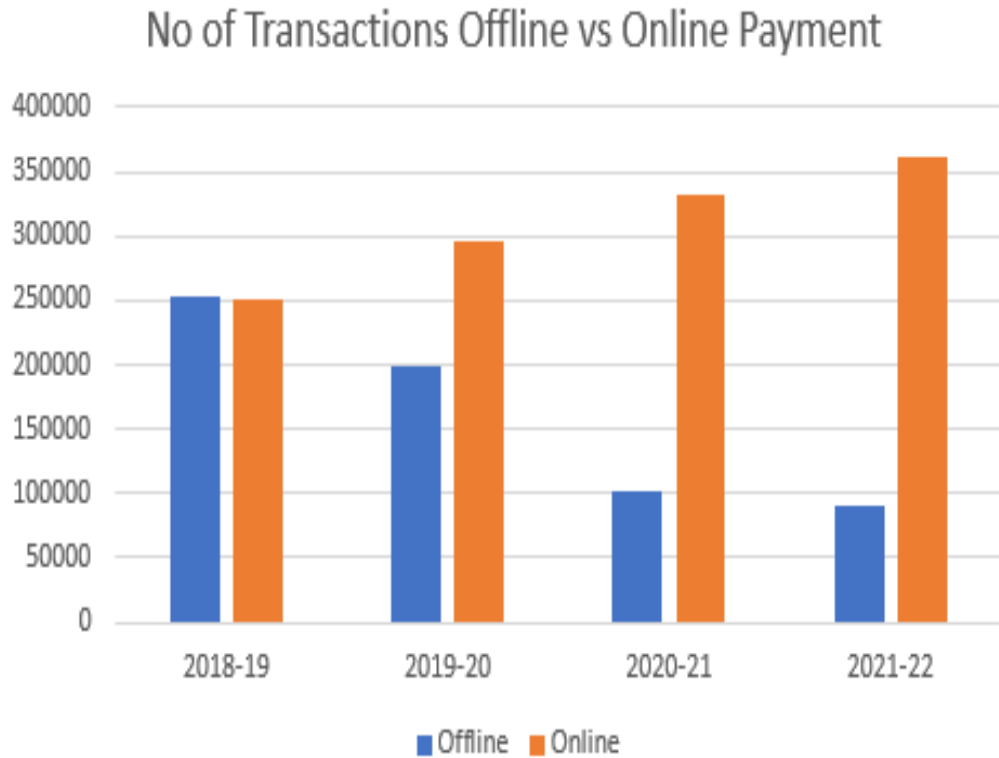
Figure 20: No of transactions offline Vs Online Payment

CHAPTER VII

CONCLUSION AND RECOMMENDATIONS

The NDMC's implementation of a 311 App for end-to-end service delivery presents a compelling case study in leveraging technology to transform citizen engagement and service delivery processes. Drawing upon theories of e-governance, network governance, and Data-Driven Decision-Making (DDDM), this study has examined the app's potential to streamline service delivery, enhance citizen participation and promote transparency within the municipality.

The success of the NDMC's 311 App lies in its alignment with core e-governance principles. By providing citizens with a single point of access for requesting services, tracking progress, and submitting feedback, the app fosters a more citizen-centric approach to service delivery (Malhotra, 2008). Furthermore, the app's potential to gather data on service requests and citizen preferences aligns with DDDM principles, enabling the NDMC to make data-driven decisions for continuous improvement (Janssen et al., 2012).

The app's contribution to network governance is also noteworthy. By providing a platform for communication and collaboration between citizens and government officials, the 311 App facilitates a more participatory approach to urban governance (Rhodes, 1997). Citizen feedback mechanisms within the app empower citizens to hold the municipality accountable for service delivery performance.

However, the study also acknowledges the limitations and challenges associated with the 311 App. Issues like occasional delays in service completion and technical glitches highlight the importance of ongoing maintenance and upgrades (Singh & Jain, 2016). Furthermore, ensuring digital inclusion through targeted outreach and support programs remains crucial for bridging the digital

divide and ensuring equitable access to the app's benefits (Jaeger & Bertot, 2011).

Key Takeaways and Recommendations

The NDMC's experience with the 311 App offers valuable takeaways for municipalities contemplating similar technology-driven initiatives:

Prioritizing User Experience: In the words of Mr Dharmendra, erstwhile Chairman of NDMC, "311 Application has option for feedback in it besides regular feedback was obtained from Market Association, Resident Welfare Association and employees." Continuously gathering user feedback and refining the app's interface based on citizen needs is vital for fostering user adoption and satisfaction (Marr, 2015).

Data Governance and Security: Mr Dharmendra in his interview has vouched that Data Privacy is of utmost concern to NDMC and it follows all protocol which are there in Govt. of India. Cyber security has proven to be a necessary investment for government organizations because it protects all categories of data from theft and damage. This includes sensitive data, Personally Identifiable Information (PII), Protected Health Information (PHI), intellectual property data and governmental information systems and helps prevent cybercriminals from gaining access to devices or the networks. NDMC is going to implement this for 360 degree cyber security. NDMC is taking various steps as per its own cyber security policy to get ISO 27001 Certification. Robust data security measures and clear data governance policies are essential for maintaining citizen trust and mitigating privacy concerns (Marr, 2015).

Building Digital Capacity: Investing in programs to bridge the digital divide and equip citizens with the skills necessary to use the app effectively ensures inclusivity and maximizes the app's impact.

Transparency and Accountability: Ex Chairman, NDMC, Mr Dharmendra has elaborated that 311 App is an online application with time lines within which services are to be provided so by design it provides transparency and

fixing accountability on the official providing the service. NDMC's success highlights the importance of transparent communication concerning service delivery timelines, app functionality and how citizen feedback is being utilized. They have admitted to being proactively approaching the citizens through the Suvidha camps and improving on any shortcomings they notice to continuously improve the App further.

Looking Ahead: The Road to Seamless Service Delivery

While the NDMC's 311 App signifies a significant step towards seamless public service delivery, continuous improvement is necessary. Further research could explore the potential of integrating the app with artificial intelligence (AI) for more efficient service delivery and chatbot functionalities for enhanced citizen support. Additionally, exploring partnerships with private service providers for specific services within the app's framework could offer citizens a wider range of options.

Beyond Service Delivery: The Broader Transformation

The NDMC's 311 App's potential extends beyond streamlining service delivery. It serves as a catalyst for broader urban transformation, aligning with frameworks like Smart Cities Mission that emphasize technology-driven solutions for improving urban life (Smart Cities Mission, 2023). Data collected through the app can be valuable for urban planning initiatives, informing strategies for infrastructure development, resource allocation, and traffic management (World Bank Group, 2015). Furthermore, the app's communication channels could be leveraged for facilitating citizen participation in urban planning projects, fostering a more collaborative approach to urban development (Nam, 2012).

A Model for Replication: Challenges and Considerations

While the NDMC's success is inspiring, replicating this model in other municipalities necessitates careful consideration of contextual factors. The socioeconomic composition, existing infrastructure, and digital literacy levels within recipient populations can impact the app's effectiveness (Shafi, Pandey, & Sharma, 2014). Furthermore, ensuring interoperability with existing government databases and service delivery platforms is crucial for seamless service integration across departments (Hughes, 2012).

Investing in the Future: Building a Culture of Innovation

The NDMC's achievement underscores the importance of fostering a culture of innovation within municipal corporations. Investing in research and development, encouraging collaboration with technology start-ups, and promoting a data-driven approach to decision-making can pave the way for continuous improvement of the 311 App and the exploration of new technological solutions for enhancing urban governance (Denhardt & Denhardt, 2007).

A Catalyst for Change

The NDMC's 311 App stands as a commendable example of leveraging technology to transform public service delivery. By providing a single point of access for service requests, promoting citizen engagement, and streamlining internal processes, the app has demonstrably improved service efficiency and citizen satisfaction. However, for the app to reach its full potential, addressing remaining challenges is crucial. Efforts to expand language accessibility, enhance public awareness, and prioritize timely service delivery will ensure inclusivity and maximize the app's impact on all citizens. Furthermore, simplifying the user interface and fostering continuous citizen engagement

through feedback mechanisms are essential for user-friendliness and ongoing improvement.

The NDMC's experience with the 311 App transcends its immediate success in service delivery. It serves as a model for broader urban transformation initiatives. Data collected through the app can inform evidence-based urban planning strategies, while the app's communication channels can facilitate citizen participation in development projects. Furthermore, the NDMC's commitment to innovation paves the way for future exploration of AI-powered service delivery and integration with other technological advancements. As the NDMC continues to refine its approach, its journey offers valuable lessons for other municipalities embarking on their own journeys towards technology-driven, citizen-centric governance. The 311 App's success story underscores the transformative potential of technology in public service delivery, while highlighting the importance of addressing inclusivity, data security, and ongoing citizen engagement for long-term success. In conclusion, the NDMC's pioneering initiative serves as a beacon, inspiring other cities to embrace technology as a catalyst for seamless service delivery and a cornerstone of a more participatory and responsive urban future.

Recommendations: Building Upon Success

The NDMC's 311 App stands as a testament to the transformative power of technology in public service delivery. However, continual improvement remains essential to ensure the app reaches its full potential and maximizes its impact on citizens' lives. Following are some of the recommendations based on the identified limitations, citizen feedback, NDMC officials (who had been involved with the very designing and implenmentation of the App) and interacting with the Champions of Change:-

Expanding Language Accessibility

Citizen requests for a multilingual interface highlight the importance of inclusivity. The NDMC should consider implementing the app in the most

commonly spoken languages within the municipal area esp the National language of Hindi, potentially leveraging machine translation tools and human oversight for accuracy. This would significantly enhance accessibility for a broader segment of the population and ensure equitable access to the app's benefits (Jaeger & Bertot, 2011).

Enhancing Public Awareness and Outreach

While the app has shown success, further efforts are needed to raise public awareness and encourage widespread adoption. In this age of social medial and smart mobile phones there can be targeted publicity campaigns across diverse media channels, also one via local newspapers, community radio, social media platforms and public notices strategically placed in neighborhoods, can significantly increase citizen awareness and app usage (Shafi et al., 2014). Additionally, collaborations with local NGOs and RWA members, Market Trader Associations (MTAs) as well as community leaders can be instrumental in promoting the app within marginalized communities.

Prioritizing Timely Service Delivery

Addressing citizen concerns regarding service completion times requires a multi-pronged approach. Analyzing service request data can help identify areas where bottlenecks may be causing delays. Streamlining internal processes, reallocating resources as needed, and providing clear timelines within the app can enhance service delivery efficiency. Additionally, exploring the potential of AI-powered service request triage and automated workflows could further expedite service completion (Janssen et al., 2012).

Simplifying the User Interface

Citizen feedback emphasizing a more user-friendly interface underscores the need for continual improvement in app design. Conducting user testing sessions with diverse demographics can provide valuable insights into areas for simplification. Employing clear, concise language, intuitive navigation menus, and visual aids such as icons, Chatbots and infographics can enhance the app's

usability, particularly for citizens with limited technical experience (Marr, 2015).

Fostering Continued Citizen Engagement

The 311 App's success hinges on ongoing citizen engagement. Incorporating features that encourage user feedback, such as in-app surveys and rating systems, allows citizens to voice their opinions and suggest improvements. Furthermore, establishing a system for regular app updates based on user feedback demonstrates the NDMC's commitment to continuous improvement and citizen-centric service delivery (Nam, 2012).

Common Municipalities Smart Services Portal (CMSSP) is a web portal developed and hosted by the NDMC. It is a common knowledge sharing portal to serve as a one-stop information portal that would not only highlight the best practices of various smart city projects in NDMC as well as other Urban Local Bodies (ULBs) of the country and abroad but also document their success and challenges in implementing smart city project. The portal candidly underscores the project experiences and highlights the steps taken by NDMC to overcome the challenges. The areas that require urgent attention are also pointed out. The portal is created to be interactive by enabling the ULBs to exchange their ideas on a common platform.   The overarching objective is to promote mutual learning for local bodies in the delivery of municipal services and utilities for the overall well-being of the population.

Conclusion

The recommendations outlined above offer a roadmap for the NDMC to further refine its 311 App and maximize its impact on citizen engagement and service delivery. By prioritizing inclusivity, enhancing public awareness, ensuring timely service delivery, simplifying the user interface, and fostering continued citizen engagement, the NDMC can solidify the app's position as a model for seamless public service delivery in the years to come. Through ongoing

innovation and a commitment to citizen-centric governance, the NDMC's journey serves as an inspiration for other municipalities, paving the way for a future where technology empowers citizens and transforms urban service delivery for the better.

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Appendix 'A' (Refers to Chap V, Page 57)

LETTER FROM IIPA TO CHAIRMAN< NDMC

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Director General
(Former Secretary, M/o Parliamentary Affairs, GoI)

14/XLIX-APPPA/13/2023-24
1ˢᵗ February, 2024

Sub: **Request for Assistance in Data Collection for Research on awarded theme of "Seamless End-to-End Delivery of Services without Human Intervention" implemented by the New Delhi Municipal Corporation (NDMC)**

Dear Sir

Air Commodore Sandeep Singh of Indian Air Force, is undergoing ten months Advanced Professional Programme in Public Administration at this Institute, which is sponsored by Department of Personnel & Training, Govt. of India (3ʳᵈ July, 2023 to 30ᵗʰ April, 2024).

As part of the course, Air Commodore Sandeep Singh, has to submit a dissertation on "Seamless End-to-End Delivery of Services without Human Intervention by NDMC" as in the Year 2021, New Delhi Municipal Corporation (NDMC) has been recognized and awarded PM's award for excellence for its pioneering work in achieving seamless end-to-end service delivery without human intervention. This remarkable feat demonstrates NDMC's commitment to leveraging technology to improve the lives of its residents. He is studying the scheme to understand its inception, objectives and implementation strategies which made it so successful.

In order to make the study meaningful, it is imperative that the research process be facilitated in the form of answering questionnaires/ granting interviews and sharing relevant data. In light of the above, we kindly request your office to issue directives to all relevant government officials and stakeholders.

The objective of the study is to analyzing how e-Governance, digitization and use of IT has transformed provisions of end-to end Service wrt two key areas i.e Electricity and Property, as also the challenges faced by the dept in achieving this feat. It is earnestly requested to facilitate the officer anyways in furtherance of a meaningful dissertation.

with ——

Yours sincerely

(Surendra Nath Tripathi)

Shri Amit Yadav, IAS
Chairperson and Member, NDMC,
Palika Kendra, Sansad Marg
New Delhi – 110001
Email: chairperson@ndmc.gov.in

EXCERPTS OF INTERVIEW WITH SHRI DHARMENDRA IAS

CHIEF SECRETARY ARUNACHAL PRADESH

ERSTWHILE CHAIRMAN NDMC

Section A: Profile of the Respondent

Name SHRI DHARMENDRA IAS

Age: Years

Sir, you have been a Champion of Change in the Scheme End to End service delivery without Human Intervention by NDMC. Here are some questions which will help me find out something interesting to unravel some mysteries and also help in validate some aspects of the research on this successful scheme: -

Questions

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No
- **Yes**   *Yes*

Q No. 2.   In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

- *I was serving as Chairman, NDMC.*

Q No. 3.   Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- **Yes**   *Yes*
- No

2

Q No. 4.   Was the implementation of such a scheme was easy?

- **No**   *No*
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- **Yes**   *Yes*
- No
- Not sure

Q No. 6.   Did the scheme change the way service delivery was being provided?

- **Yes**   *Yes*
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

Challenges for any shift to online services starts with digitisation of data and thereafter the resistance to change comes from the people who are implementing these services. Resistance from employees can be managed by educating about the details of the scheme including how it will facilitate and benefit them and also provide the assured convenient service to the public.

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Application was made user friendly and expandable so that more services can be added with time. Initially 49 services were made online for public and 11 services for NDMC employees.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

NDMC has elaborate scheme for Data Security to ensure citizen information remain protected.

User Experience and Adoption

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

By launching information campaign through its website and hoardings in NDMC offices, dispensaries and hospitals.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Application has option for feedback in it besides regular feedback was obtained from Market Association, Resident Welfare Association and employees.

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

As I am not in NDMC so would not be having this data. It can be obtained from the IT department of NDMC.

Sustainability and Scalability

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

There is in built mechanism for maintenance of 311 App and payment is done by NDMC on per user basis.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

It is a professionally managed platform committed to provide managed service solutions.

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

This is a municipal service solution so other municipalities can use it and if need be adjust it and make modification as per their need.

Ethical Considerations and Transparency

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

Since, it is a standard software for Municipal Services which are rendered uniformly to all residents of NDMC irrespectively of their location, income status or social status. Data Privacy is of utmost concern to NDMC and it follows all protocol which are there in Govt. of India.

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

As it is an online application with time lines within which services are to be provided so by design it provides transparency and fixing accountability on the official providing the service.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

Public trust is maintained by providing assured service in time to its resident. Potential concern of data security is addressed by adopting security protocol by Govt. of India.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- **Very important**   *Very Important.*
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- **Yes**   *Yes*
- No

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- **Very important**   *Very Important.*
- Important
- Moderately important
- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- **Extremely essential**   *Extremely essential.*
- Essential
- Moderately essential
- Not essential

Future Outlook

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

I am sure that in future all Municipal Services will be given or accessed by residents on 311 App. On the employees of NDMC front also all NDMC employees services (G to G) will also be available online on this platform.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

Technology can totally change the municipal service delivery in the urban areas. From payment of property tax, to cleaning of street and sanctioning of building plan will be through online mode.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

- *Take all state holders on board before starting.*
- *Convince the employees about the ease it will bring in work.*
- *Efficient solution for digitising the record.*
- *Stop offline delivery of service which is made online.*
- *Smart online System to monitor service delivery.*
- *Collect regular feedback from online users.*

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- **Very optimistic**
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

I am very optimistic about the long term success and sustainability of the public delivery through digital mode. In fact this is running successfully for the last three years which is an indication of its long term sustainability.

EXCERPTS OF INTERVIEW WITH SHRI DP SINGH IAS

SPL SECRETARY MOUD, UP

ERSTWHILE DIR IT, NDMC

Section A: Profile of the Respondent

Name SHRI DP SINGH IAS

Age   Years

Questionnaire

Questions

Sir, you have been a Champion of Change in the Scheme End to End service delivery without Human Intervention by NDMC. Here are some questions which will help me find out something interesting to unravel some mysteries and also help in validate some aspects of the research on this successful scheme: -

Implementation and Design:

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No

- Yes

Q No. 2.   In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

As Director IT,, NDMC

Q No. 3.   Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- Yes
- No
- Not sure

Q No. 4.   Was the implementation of such a scheme was easy?

- No
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- Yes
- No
- Not sure

Q No. 6.   Did the scheme change the way service delivery was being provided?

- Yes
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

Design, Protocol definitions for various departments, Awareness of the App and Geo Tagging of Boundaries, Mapping of Officials from the departments/divisions.

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Simple to use and understand Interface for user. Robust feedback system from citizen and meticulous end to end monitoring by the Senior Officers and the resolution of the grievances of the citizens.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

Yes, Data security guidelines for security of data of citizens is followed as per govt guidelines.

User Experience and Adoption:

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

By placing Advertisments on Web Site, Toll Free Numbers, during the payment of electricity bill and water dues prompts were given to use online apps etc.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Feedback module is also available in the NDMC-311 App for Citizens to put their feedback related to improvement of application and resolution of the grievances mechanism.

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

97.5 percentage satisfaction of the complaint resolution rate of citizens.

Sustainability and Scalability:

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

Self-Funded by NDMC.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

Time and again the App is upgraded as per the need of the Municipality and Govt requirements to meet the standard as prescribed by MHA and MOUD.

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

The other municipalities need to develop similar application to better E-governance.

Ethical Considerations and Transparency:

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

The citizen may have to register and create Login ID and Password. The same is accessible only to relevant NDMC officials through Role Based Access.

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

The hierarchy has been designed as per SOP for every Dept to escalate the Grievances to the senior officials and same is visible to the citizen.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

Through Feedback mechanism and incorporation of new changes and upgrading as required.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- Very important ⬅
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- Yes ⬅
- No
- Not sure

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- Very important ◀
- Important
- Moderately important
- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- Extremely essential ◀
- Essential
- Moderately essential
- Not essential

Future Outlook:

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

Implementation of AI based Chat and Blockchain for quicker and safe operation of the application.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

The technology driven solution impacted the municipality to quicker resolutions of the grievances and delivery of the services at doorstep and more secured with endorsement of the digital platform.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

Provide digital delivery of the services to the doorstep, proper implementation of E-Governance with timeline adherence to deliver the services.

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- Very optimistic
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

EXCERPTS OF INTERVIEW WITH MS KRITIKA CHOUDHARY
DIR IT, NDMC

Section A: Profile of the Respondent

Name MS KRITIKA CHOUDHARY

Section B: Questionnaire

Questions

Implementation and Design:

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No
- Yes

Q No. 2. In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

As Director IT

Q No. 3. Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- Yes
- No
- Not sure

Q No. 4. Was the implementation of such a scheme was easy?

- No
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- Yes
- No
- Not sure

Q No. 6.   Did the scheme change the way service delivery was being provided?

- Yes
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

Familirisation of application among APP users..

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Walk through videos are available.

311 is a user friendly App interface with simple options which were put on home

page for easy access, help option is also there.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

311 App is a secured App and adequate measures have already been taken.

User Experience and Adoption:

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

Through wide publicity e.g suvidha camps where any one if wants to get familiar can be made so.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Through door to door tablet campaign

Through App feedback suggestions..

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

Complaint resolution percentage has almost reached 99 percent from 2016 till date..

Sustainability and Scalability:

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

NDMC has engaged a vendor for maintenance of the Application.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

The App is updated technologically time to time.

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

App should be simple, user friendly, with regular monitoring of issues and act on the feedback received.

Ethical Considerations and Transparency:

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

The App is being taken for Cyber Security Audit.

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

Complaint activity / rectification I svisible to all officials under hierarchy and citizens alike.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

Through transparency in complaint resolution and effective feedback mechanism.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- Very important
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- Yes
- No
- Not sure

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- Very important
- Important
- Moderately important
- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- Extremely essential ⬉
- Essential
- Moderately essential
- Not essential

Future Outlook:

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

Way forward for 100% faceless customer support with AI enabled protocols.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

Techonology advancements should be integrated in 311 App to cater citizen request more effectively.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

Geo Fencing of area of officials should marked for proper marking of complaints to the relevant officers.

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- Very optimistic
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

EXCERPTS OF INTERVIEW WITH MR ABDUL WAHID ANSARI
JT DIR COMMERCIAL, NDMC

Section A: Profile of the Respondent

Name Mr ABDUL WAHID ANSARI

AGE 54 YRS

Section B: Questionnaire

 Questions

Implementation and Design:

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No

- Yes

Q No. 2.   In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

As Joint Director IT

Q No. 3.   Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- Yes
- No
- Not sure

Q No. 4.   Was the implementation of such a scheme was easy?

- No
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- Yes
- No
- Not sure

Q No. 6.   Did the scheme change the way service delivery was being provided?

- Yes
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

Design, Dissemination of the App and the Geo Tagging of Boundaries, Mapping of Officials from the divisions of all concerned departments.

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Easy Interface for users and feedback system of the citizen and end to end monitoring by the Senior Officers and the resolution of the grievances of the citizens.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

Yes, Data is placed on cloud with security audit from the certified firms as per MEITY guidelines.

User Experience and Adoption:

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

By Flashing in the Marquis of Web Site, Toll Free Numbers, during the payment of electricity bill and water dues prompts were given to use ionline apps etc.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Feedback module is also available in the NDMC-311 App for Citizens to put their feedback related to improvement of application and resolution of the grievances mechanism.

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

97.5 percentage satisfaction of the complaint resolution rate of citizens.

Sustainability and Scalability:

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

Self-Funded by NDMC.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

Time and again the App is upgraded as per the need of the Municipality and Govt requirements to meet the standard as prescribed by MHA and MOUD.

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

This APP id integrated with the Swacheta App developed by MOUD for monitoring and feedback by the Government. So the same other municipalities need to develop similar application.

Ethical Considerations and Transparency:

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

The citizen may register on NDMC – 311 App and create Login ID and Password for privacy and it may be accessible for the registration of citizen and also accessible to the NDMC officials through Role Based Access.

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

The hierarchy has been designed as per SOP for every Department to escalate the Grievances to the senior officials and same is visible to the citizen.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

Through Feedback mechanism and incorporation of new changes and upgrading as required.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- Very important
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- Yes ✒

- No

- Not sure

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- Very important ✒

- Important

- Moderately important

- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- Extremely essential ✒

- Essential

- Moderately essential

- Not essential

Future Outlook:

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

To get the implementation of AI based Chat and Blockchain technology to make it more robust and secured, to keep the interest of citizen in quicker and safe operation of the application.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

The technology driven solution impacted the municipality to quicker resolutions of the grievances and delivery of the services at doorstep and more secured with endorsement of the digital platform.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

To win the faith of citizen is to give the digital delivery of the services to the doorstep and proper implementation of E-Governance with clear mandate of timeline adherence to deliver the services.

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- Very optimistic
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

EXCERPTS OF INTERVIEW WITH SHRI RAJ KAMAL SINGH

SENIOR IT PROGRAMMER, NDMC

Section A: Profile of the Respondent

Name SHRI RAJ KAMAL SINGH

Age   37   Years

Section B: Questionnaire

 Questions

Implementation and Design:

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No
- Yes

Q No. 2.　　In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

I was looking after the protocol and design as a Senior IT programmer.

Q No. 3.　　Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- Yes
- No
- Not sure

Q No. 4.　　Was the implementation of such a scheme was easy?

- No　*A lot of hard work was involved*
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- Yes
- No
- Not sure

Q No. 6.　　Did the scheme change the way service delivery was being provided?

- Yes
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

Geo Fencing of area/boundaries, Escalation matrix etc.

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Made Easy and simple to understand. Will be converted to multilingual soon.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

Multi factor Authentication (MAF),

Role based Access and

Data stored in cloud.

User Experience and Adoption:

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

Through Advertisement, Toll Free Number, WhatApp and SMSs.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Feedback through App and through call.

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

Ccomplaint resolution rate is 97.5 percentage from Apr 2023 till date.

Sustainability and Scalability:

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

This product works as Software as a Service (SAS) funded by NDMC and NDMC smart city.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

Now we are going to implement AI based Blockchain.

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

It must be implemented by other municipalities for seamless service delivery.

Ethical Considerations and Transparency:

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

All data is in encrypted from and stored in Cloud. Plan is to store the same in NDMC Data Centre.

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

The complaint activity is visible to citizen and officers also. If the citizen is unsatisfied, he can reopen a complaint.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

If the complaint is not resolved within a given timeframe same is escalated to a senior official automatically.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- Very important
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- Yes
- No
- Not sure

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- Very important
- Important
- Moderately important
- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- Extremely essential
- Essential
- Moderately essential
- Not essential

Future Outlook:

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

Implementing AI, Reduced resolution time, increased transparency, reduced repeated complaint and better tracking of complaint.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

Make public services delivery at doorstep and in a time bound manner.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

Digital India movement is the future of Public Service Delivery. All Dept should be integrated through API for seamless delivery of any service.

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- Very optimistic
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

EXCERPTS OF INTERVIEW WITH SHRI GAURI SHANKER AGRAWAL
SE, ICCC, NDMC

Section A: Profile of the Respondent

Name SHRI GAURI SHANKER AGRAWAL

Age   56   Years

Section B: Questionnaire

Questions

Implementation and Design:

Q No. 1. Were you been associated with the NDMC for the Scheme of Seamless End to End delivery of Public Services without Human Intervention?

- No

- Yes

Q No. 2. In what capacity were you serving in NDMC when the scheme was launched / awarded by the PM?

As Nodal officer for ICCC, NDMC.

Q No. 3. Were you involved with the conceptualisation, refinement, operation or implementation, improvement of the Scheme?

- Yes
- No
- Not sure

Q No. 4. Was the implementation of such a scheme was easy?

- No
- Yes
- Not sure

Q No. 5. Did you face some challenges that you had to overcome?

- Yes
- No
- Not sure

Q No. 6. Did the scheme change the way service delivery was being provided?

- Yes
- No
- Not sure

Q No. 7.   What were the key challenges faced during the initial development and implementation of the 311 App?

There was a lot of integration required integrating the 30-40 applications. For Intyegration of any service with ICCC firstly, it had to be digitised and application to be developed. Implementation of one application in single department lot of process flow gathering, modification in process and development and testing of application and thereafter monitoring of day to day operations.

Q No. 8.   How did the municipality ensure that the app catered to diverse needs, considering factors like language, literacy levels, and technological access?

Simple Interface

Most of the services required to citizen are part of 311 App and ICCC.

Q No. 9.   Where data security and privacy measures were put in place to ensure citizen information remained protected?

In process for 27001 certification.

User based multilingual authentication

Following all requirements of Cyber Security as per GoI..

User Experience and Adoption:

Q No. 10.   How did the municipality encourage citizen adoption of the 311 App and overcome potential barriers to access?

Citizen can take service through multiple interface like 311 App, Toll free number, NDMC website, WhatsApp, facebook etc.

Q No. 11.   What strategies were implemented to gather user feedback and continuously improve the app's functionality and user experience?

Citizen Feedback

On telephone also.

Q No. 12.   Can you share any metrics or data on citizen satisfaction with the 311 App and the overall impact on service delivery efficiency?

97.5 percentage satisfaction of the complaint resolution rate of citizens.

Sustainability and Scalability:

Q No. 13.   How is the ongoing maintenance and development of the 311 App funded and managed within the municipal corporation?

Self-Funded by NDMC. Comprehensive maintenance given for 5 yrs already to implementation agency for ICCC.

Q No. 14.   What strategies are in place to ensure the 311 App remains relevant and adaptable to evolving needs and technological advancements?

New services are added as and when implemented in NDMC

Q No. 15.   Can you share any insights or advice for other municipalities considering implementing similar technology-driven service delivery solutions?

Multiple Municipalities can be integrated on a single ICCC application for monitoring different services.

Ethical Considerations and Transparency:

Q No. 16.   How did the municipality address potential ethical considerations related to data privacy, algorithmic bias, and accessibility for all citizens?

No data is being shared with anyone outside..

Q No. 17   What measures were taken to ensure transparency and accountability throughout the design, implementation, and operation of the 311 App?

Effective and prompt Customer Feedback.

Q No. 18.   How does the municipality maintain public trust and address potential concerns related to the use of technology in service delivery?

Service Level Agreements (SLAs) and SOPs have been prepared. If not delivered in particular defined SLA the same is escalated to higher level, through ICCC applications, SLAs and SOPs are operated and monitored.

Technology Adoption

Q No. 19.   How important is the adoption of technology in reducing manual tasks and improving efficiency for providing services to the citizen?

- Very important ←
- Important
- Moderately important
- Not important

Q No. 20.   Should all Municipal Corporations actively resort to providing public services to citizens by online mode like 311 App?

- Yes ←
- No
- Not sure

Community Engagement

Q No. 21. How important is community engagement and feedback from citizen while implementing the services in an online mode?

- Very important ←
- Important
- Moderately important
- Not important

Q No. 22.   How essential is it to advertise in multilingual languages, how to avail the public services through online mode via 311 App to through use of social media/TV/ print media?

- Extremely essential

- Essential ◄

- Moderately essential

- Not essential

Future Outlook:

Q No. 23.   What are your hopes and aspirations for the future development and impact of the 311 App within the municipality?

ICCC is the future need for all Municipalities for effective delivery of services to the citizens.

Q No. 24.   In your view, what role can technology-driven solutions play in transforming the landscape of municipal service delivery in the future?

Service delivery of municipal services can be delivered effectively in a time bound manner with the use of technology.

Q No. 25.   What key lessons have you learned from this experience that could be valuable to other changemakers looking to implement similar initiatives?

E-Governance, Digital India and use of ICCC application will change the face of any municipality.

Q No. 26.   How optimistic are you about the long-term success and sustainability of public service delivery in an efficient and transparent manner thorough the online digital mode via this End to End service delivery scheme?

- Very optimistic
- Optimistic
- Neutral
- Pessimistic
- Very pessimistic

QUESTIONNAIRE TO BE SENT BY GOOGLE FORM

WHATSAPP MESSAGE

Respected Sirs/Dear friends,

I am undertaking a research/study on "End to End Public Service Delivery without Human Intervention through 311 app by NDMC".
May I solicit your inputs for my dissertation. It will take just 3-4 minutes of your time. Your Inputs may help improve the 311 APP further helping all Citizens.
Also, May I request …Pl Request forward it to others for inputs on survey.
Thank you.

This questionnaire may not be directly applicable to many of the officers/citizens, but request forward to those who stay in the NDMC area of Delhi.

TOPIC: A STUDY ON END-TO-END PUBLIC SERVICE DELIVERY (OF ELECTRICITY AND PROPERTY) THROUGH 311 APP FOR PUBLIC SERVICE DELIVERY BY NDMC"

I am undergoing a ten-month full-time program at Indian Institute of Public Administration (IIPA), and my dissertation focuses on the study of the awarded scheme "End to End Public Service Delivery by NDMC without human intervention". I am grateful for your participation in this academic journey.

This questionnaire relates to 311 APP of NDMC and its accessibility, user satisfaction, ease of operating APP, satisfaction achieved etc. It also gathers inputs for the long-term sustainability & scalability of online service delivery by NDMC and recommendations for its improvement. The data collated will be solely used for academic purpose only.

Section 1: Demographics
Your Name

Age

Less than 30
30 to 40
40 to 50

50 to 60
60 and above

This is a required question

Gender

Male
Female
Others

Educational Qualification

High School and less
Bachelor's Degree
Master's Degree
Doctorate or Higher

Occupation

State Govt Profession
Central Govt Profession
Private/Corporates
Self-Occupation

Are you aware of 311 App and online service delivery website/platform of
NDMC, the digital platform for government services in NDMC area of New
Delhi?

 Yes
No

Have you used 311 App and online service delivery website/platform of
NDMC to access government services?
Yes
No

If you have used the same, please rate your experience in terms of
accessibility (ease of finding and accessing services)

Very Difficult   12345   Very Easy

Which services have you accessed ? (Check all that apply)

Birth Certificate
Issuance and Renewal of Student Bus Pass
Approval of Building Plan for construction of house
Property Tax Payment
Electricity Board – Complaints and Grievances Redressal
Grievances relating to farmers issue

Compared to traditional offline methods, do you find online app or website interace more convenient for accessing government services?

Much less convenient
1
2
3
4
5
Much more convenient

Name any three services where focus and additional impetus is required?

Section 3: User Satisfaction

Please rate your overall satisfaction with the services provided through 311 app of NDMC   //   311 APP sey aap kita satisfied hain? *
Very Dissatisfied
1
2
3
4
5
Very Satisfied

To what extent as per you the 311 app of NDMC.has become successful in getting public services?   // 311 APP Public service dene mein kitna sakshyam hua hai?

 *
Less than 30%
30 to 50 %
50 to 60 %
60 to 75 %
More than 75 %

How would you rate the responsiveness of 311 app of NDMC in addressing your service requests or queries? // 311 APP ko aap kitna prabhavi manneygey public service ko aasan bananey key liyea?

*
Not Responsive at All
1
2
3

4
5
Very Responsive

Please rate your satisfaction with the following aspects of using 311 app of NDMC services on a scale of 1 to 5 (1 being and 5 being very satisfied) // Kya aap 311 APP key istmal key dwara public service milney sey santusht hai?

 Ease of use of APP //   311 APP ko istmal karna kitna aasan hai?
*
1
2
3
4
5

What is the Response time for deliver the services requested by you?   //   Kitney samay mein aapko service mili iss APP ko istmal karkay?
*
1
2
3
4
5

Clarity of information provided by the 311 APP //   Kya 311 APP mein services ki information saaf aur aasam hai??

 *
1
2
3
4
5

Overall service quality through 311 APP

 *
1
2
3
4
5

What factors influenced your decision to use 311 APP of NDMC for accessing government services? (Check all that apply) // Aapney 311 APP kyon istmal kiya??

*
Convenience
Time-saving
Accessibility
Previous positive experiences
Recommendations from others
Government incentives
Other:

Have you encountered any technical issues or challenges while using 311 APP of NDMC? (e.g., website errors, login problems) // 311 APP istmal kartey waqt koi samasya aapney face kari hai??

Yes
No

If yes, please describe the technical issues or challenges you faced (else type NA) // **Kin kshetron mein isme sudhar ki avashyakta hai?**

 NA
*

Do you want the 311 APP to be in more languages like Hindi/Punjabi etc.
Yes
No

Do you think all Government services be provided in Digital/ On-line mode // Kya sari sarkari scheme aur service online honi chaiyea

Yes
No
Maybe

Thank you for participating in this survey. Your input is valuable. If you would like to be contacted for follow-up questions or further research, please provide your email address (optional)

PHOTOGRAPHS FROM FIELD P&T COLONY