A Critical Review on Smart City Platform Development for Waste Management

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Abstract- *Coimbatore city is one of the smart cities. There are many projects going on for the development of Coimbatore as a smart city .Waste management has become a challenge before society as it is being continuously neglected in the field of environment which is getting harmful for the health of living organism's as well as the environment. Effective waste management strategies are required that involves a synchronized system of controlling the production and disposal of wastes. Most of the waste management techniques like landfills, incineration, sanitary landfills provide a variety of environmental benefits but have negative impacts too like emission of large amount of green house gas. This paper reveals the risk and issues occurred during all stages of waste management and find the smart solution for those major issues thereby developing the platform of smart city for waste management.*

Keywords- smart city, waste management, issues, risk, smart solution

I. INTRODUCTION

Smart city is that a city equipped with basic infrastructure to give a decent quality of life, a clean and sustainable environment through applications of smart solution. Around 100 cities are set to be developed as smart cities civic bodies have to redraw long term vision in swm (solid waste management) and rework their strategies. The government of India had notified the municipal solid waste (management and handling) rules in 2000, thereby making it mandatory for all urban local bodies in the country to engage in collection, segregation, secondary storage in covered bins, transportation in covered vehicles, processing through composing or waste to energy technologies and disposal of rejects in engineered sanitary landfills. The smart city consist of several services for the betterment of urban area .Thus this paper is all about the identification of the prevalent issues and risk in the existing solid waste management system and finding the smart solutions for those issues.

II. REVIEW OF LITERATURE

Nasrin Khansari, Ali Mostashari and Mo Mansouri Mohammad Ali

"Impacting Sustainable Behaviour and Planning in Smart City".

In this paper the author describes the concept of "smart", "intelligent", or "cognitive" cities has gained increasing attention as an approach for addressing the challenges of urban management. Stipulated that information resulting from a smart city implementation has a two-fold impact: (1) it shifts the social behaviour of citizens towards a more efficient and sustainable utilization of city resources (2) it allows service providers (such as utilities and transit companies) and city government to provide more efficient and sustainable services (top-down).

Kazi Akib Bin Asad, Nadim Reza Khandaker

"Municipal Solid Waste Landfill in Dhaka: A Sustainable Approach for Energy Generation".

The major study in this paper is the landfill attributes the capability to rotate use of cells for waste treatment over a lifespan of over 50 years. Beyond that, based on the topography and location of the landfill site, it can be renovated into a park or recreational center. Initiatives as such will result in reducing carbon footprint and fighting climate change as well the development of new landfill facility is a major step in the quest to attain sustainability and a green future for Dhaka city.

Vincenzo Catania and Daniela Ventura

"An approach for monitoring and smart planning of urban solid waste management using smart-m3 platform"

In this paper an approach to smart waste collection is proposed able to improve and optimize the handling of solid urban waste. Context of smart waste management requires interconnection among heterogeneous devices and data sharing involving a large amount of people. Smart-M3 platform solves these problems offering a high degree of decoupling and scalability. Moreover, the proposed solution is flexible and decoupled respect to the algorithm to determine optimal number of bins and vehicles or to the algorithm to define the best route for vehicles. Therefore, future works can

be made in the study of models that offer the best results in terms of decision-making.

Parul dixit, Shailendra deva.

"Automated solid waste management for smart cities: A review".

this paper consist of latest surveyed research work in order to contribute to decode this problem without or with less human intervention as solid waste management is full of filth and require much concern for the beautiful and hygienic environment**.** This paper concludes IOTcan be proved to have better quality life and improve the standard solid waste management techniques for bright and beautiful future.

Andre Castro lundin, Ali gurcan ozkil

"Smart cities: A case study in waste monitoring and management"

This paper explores the potential of employing sensor enabled solutions to improve on waste monitoring and collection in public trash bins. Through a user-centered design approach, an inexpensive monitoring system developed and tested in pilot study.

Jose M.Gutierrez, Michal Jensen, Morten Henius and Tahir Riaz

"Smart waste collection system based on location intelligence"

This paper practically demonstrates how Internet of Things (IoT) integration with data access networks, Geographic Information Systems (GIS), combinatorial optimization, and electronic engineering can contribute to improve cities' management systems the paper is focused on the efficiency and economic feasibility of the system, in order to motivate the potential interested parties to deploy intelligent solutions for common city services. The experiments are carried out on a Geographic Information Systems simulation environment, applying graph optimization algorithms and taking advantage of available Open Data about the city of Copenhagen, Denmark.

KuldeepSingh, NehaSharma and Pranay Gunna.

"Smart cities in India: key areas and challenges-case study of Chandigarh city"
This paper focuses on the concept of smart city as the Government of India launched the smart city project for developing 100 smart cities (now 98 smart cities) in the

country and also concentrates on the challenges as well as the key areas for development of smart cities in India along with the case study of Chandigarh.

Akashi Patel, Bharat Jhamnani

"Optimization Model for Integrated Solid Waste Management in Gurugram".

This paper deals with the optimization conditions for sustainable approach to SWM are a key factor for managers and planners. Currently, the planners and decision-makers in the area of integrated solid waste management are confronting increased complexity uncertainty and multi-objectivity of this issue. At the beginning, the process of decision-making on SWM was simple. It is because of the decisions were made only through simple comparison of some options out of the available options.

Romano fistola, Rosa Anna la Rocca

"Smart city planning: a systemic approach"

This paper tries to answer to these questions by adopting the systemic approach to study the city. This allows considering the city as a complex system subdivided in three main subsystems (anthropic, functional and physical) which are basic in order to identify the city smartness components. These three systems are connected and interacting in the urban system and the smartness level inside the city can be related to their State.

F. Pirlone and I. Spadaro

"Towards a waste management plan for Smart cities"

The objective of this paper is to present the current situation regarding the EU and Italian legislation and the existing tools aimed at sustainable waste management. About laws, the Waste Directive (2008) is important because it introduces the concept of prevention in the production of waste as one of the primary objectives. In particular, the strategy of waste management should foresee the reduction of the quantity and the hazard level of waste in a perspective of sustainable development.

Riya A. Kanase, Yuvraj K. Kanse

"A Review Paper on IoT Based Smart Garbage Alert System"
This paper proposed the technique of smart Garbage Alert system which checks the waste level over the dustbin with the help of Ultrasonic Sensor system. By using sensor the system

measure weight of waste and level of waste inside the dustbin. System is adopted by Network Environment, to manage all information from waste. To overcome such issues Garbage Alert system is proposed for smart cities based on Internet of Things (IoT). In this system there are different types of waste and waste bins situated all over the city.

A.Sivasankari, V.Priyavadana

"Smart planning in solid waste management for a sustainable smart city"

This paper describes an approach to smart waste collection is proposed able to improve and optimize the handling of solid waste by using smart dustbins.

S.A. Mahajan, Akshay Kokane, Apoorva Shewale, and Mrunaya Shinde

"Smart Waste Management System using IoT"

This paper shows how the smart waste management using IoT can be implemented. This proposed system assures the collection of garbage soon when the garbage level reaches its maximum level. The system will thus provide accurate reports, increasing the efficiency of the system. The real-time monitoring of the garbage level with the help of sensors and wireless communication will reduce the total number of trips required of GCV and thus, will reduce the total expenditure associated with the garbage collection

Suraj A.Sutar, Sagar M. Gawande

"Solid Waste Management in Rural Areas emerging towards growth centre through GIS system- Mahalung, Solapur"

This paper deals with an attempt has been made to provide a comprehensive review of the characteristics, generation, collection and transportation, disposal and treatment technologies of solid waste management in rural areas. The study pertaining to solid waste management in rural areas has been carried out to evaluate the current status and identify the major problems with the help of GIS software. Various adopted treatment technologies options for solid waste are critically reviewed, along with their advantages and limitations

Maaz Allah Khan, Mohd Zafar Siddiqi, Mohd Waqar Waseem and Nizamuddeen
"Solid Waste Management"

This paper is about the study of solid waste management has been carried out to evaluate the current status and identify the major problem. Solid waste is treated and disposes by a various method-Incineration, Composting, Landfill, Recycling and Windrow composting. Solid waste is use as a waste energy. Study of solid waste management is modified the present system of solid waste disposal and further use as energy.

Rishabh Srivastava

"Waste Management: Developed and Developing Countries"

This paper focuses on the comparison of municipal solid waste management techniques in India and some of the European countries (Germany and Netherlands). The improvisation of laws and involvement of local authorities along with awareness amongst people play a major role in waste management in developed countries. This study also depicts the requirement of advanced techniques and proper laws in developing countries i.e. India and learning of avoidance methods for minimisation of waste along with its utilisation instead of dumping.

Omkar Parishwad, Trishubh Singh

"Analyzing and Rating Smart City Development in India"

This paper centers the infrastructural developments for the Smart Urban Development in India. The research helps us arrive at a general line of action for Urban Planning implications catering to the Infrastructure Sector, amongst others; thus affecting environmental, social and economic structure significantly. The study further finds the scope of progress, encouraged from various government policies for successful implementation of Smart City Development. It also allows a peek into future scenario of improvements and deliberations particular to Indian standards in consideration with the scenario of other countries.

Ramamurthy Venkatesh, Chintan Vadgama and Madhavi Damle

"Smart cities – challenges and implementation approaches: comparison perspective in India, uae and Singapore"

This paper looks in to the challenges and implementation approaches in select nations as a way to benchmark how Indian models shall adopt this paper discussed about Key success factors for SCP implementation in India will largely depend upon the level of citizen participation and project management capabilities at ULB/district levels by adapting to

measurable KPIs as propose earlier. As per reported news, initially 20 Indian cities will be subjected to Smart City implementation plan as per published list of Indian Government. Involvement of Public private participation, especially the managed services providers (MSPs), suggested model needs further dimension of "maturity level" similar or same as what is proposed by European Commission Initiative, Smart Cities and Communities.

Olga Rybnytska, Frada Burstein, and Arkady Zaslavsky A. Zuraida, S.Norshahida

"Decision support for optimizing waste management".

This paper shows to create a practical solution for reducing CO2 emissions and reduce negative impact on the environment as a result. From the design science perspective, a DSS is proposed, researched and developed to increase the effectiveness of municipal waste management. The paper also evaluates this approach against the Green IS framework. The project has a potential for further research. First, the impact of the city size is an opportunity for future investigation. Secondly, the data collected from sensors and then processed By the DSS

Lakshmi Devi P, Chandan B

"IOT Based Waste Management System for Smart City"

This paper gives the information about the waste garbage management in a smart way. Internet and its applications have become an integral part of today's human lifestyle. It has become an essential tool in every aspect. Due to the tremendous demand and necessity, researchers went beyond connecting just computers into the web. These researches led to the birth of a sensational gizmo, Internet of Things (IOT). Communication over the internet has grown from user - user interaction to device - device interactions these days. The IOT concepts were proposed years back but still it's in the initial stage of commercial deployment. IOT can be used to provide a platform for smart garbage management. Some of the commonly used methods are implemented using sensors and microcontrollers.

III. CONCLUSION

From the above paper the Issues and risks of the solid waste management and the process to recycle along with their properties, which involve Primary Collection, Waste Transportation, Storage, Treatment and Disposal has been studied. The main objective of this study is to rectify the above risks and issues by using Smart solutions like Sensors,

IoT, and Smart Bins. This help to develop the clean and healthy environment free from solid waste.

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