Beyond the Gridlock: A Comparative Study of HTMS and ATMS in Achieving Sustainable Traffic Solutions for Dhaka City

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Abstract

Urban areas grapple with a formidable challenge to sustainability and quality of life due to traffic congestion. This study examines the intricacies of traffic management in Dhaka City, investigating the potential of both the Human Traffic Management System (HTMS) and Automated Traffic Management System (ATMS) in alleviating gridlock and fostering sustainable transportation solutions. The inquiry commences with a comprehensive analysis of the existing traffic scenario in Dhaka City, pinpointing critical pain points and challenges contributing to persistent congestion. Subsequently, the study introduces two primary traffic management approaches: HTMS, characterized by human-operated systems, and ATMS, relying on automated technologies. Conducting an extensive comparative analysis, this research evaluates the effectiveness, advantages, and limitations of both HTMS and ATMS within the unique traffic landscape of Dhaka City. Parameters such as real-time adaptability, scalability, environmental impact, and cost-effectiveness are carefully examined to gauge the overall sustainability of these systems. Moreover, the study delves into the social and economic implications of implementing HTMS and ATMS, incorporating perspectives from commuters, local businesses, and city planners. The exploration extends to the potential for integrating these systems, proposing a hybrid model that optimizes the strengths of both approaches. The research findings offer valuable insights for policymakers, urban planners, and traffic management authorities in Dhaka City, furnishing a roadmap for the adoption of sustainable traffic solutions. Ultimately, this study endeavors to shape the development of a tailored traffic management strategy that transcends gridlock, ensuring a sustainable and smoother traffic flow in Dhaka City.

Keywords
Lean and Green Manufacturing, Life Cycle Assessment, Cleaner Production, Furniture Industry, Synergy.

Biographies

Ibrar Amin was born in September 2002 in Chittagong into a family that combines economic skills with familial duties. The basis for his upbringing was laid by his mother, a devoted housewife, and his father, an experienced businessman. Ibrar accomplished scholastic success in 2019 by passing his HSC exam at Bepza Public School and College after earning his SSC credential from Halishahar Cantonment Public School and College. Currently pursuing a bachelor's degree in computer science at the American International University Bangladesh, Ibrar is strategically positioning himself within the dynamic landscape of technology. His academic pursuits are concentrated in areas that fuel his fervor—namely, machine learning, natural language processing (NLP), and artificial intelligence (AI). Possessing an insatiable curiosity and an unwavering commitment to remaining at the forefront of technological

advancements, Ibrar Amin envisions a future where his expertise significantly contributes to the ever-evolving realm of computer science.

Ishrakul Tahmid is a student at American International University-Bangladesh (AIUB), pursuing a degree in Computer Science and Engineering (CSE). Throughout his academic journey, he has excelled in coursework and has made significant contributions to the field of data science. Known for his thorough attention to detail and the ability to simplify complex data into practical recommendations, Ishrakul has established himself as a promising talent in the field. His commitment to innovation and problem-solving in data science has garnered recognition from both peers and faculty. As he works towards his CSE degree at AIUB, Ishrakul is prepared to make meaningful impacts on the constantly evolving field of statistical data analysis and machine learning. He expresses excitement about the potential to utilize his knowledge and skills to create innovative solutions for real-world problems in his future endeavors.

Faiza Mahmood Aroni is an aspirational undergraduate studying computer science and engineering at American International University-Bangladesh. She has a love for investigating the nexus between creativity and technology. She started in the arts as a painter and singer before transferring to computer science to use her fast-learning speed, analytical thinking, and high attention to detail as a creative outlet. Her passion for creating novel solutions drives her research interests, which are in the ever-evolving domains of machine learning (ML) and artificial intelligence (AI). She is dedicated to advancing these fields as a skilled data visualizer and analytical thinker. Her meticulous approach to problem-solving and unwavering dedication to excellence, developed through extracurricular activities, equip her to tackle the demands of cutting-edge research. Her goal is to combine her technical expertise with artistic intuition by pursuing computer science and engineering. She is thrilled to work with mentors who are as passionate about revolutionary technologies as she is and to offer her viewpoint to the research community.

Md. Mortuza Ahmmed a Statistician with an extensive range of research interests. His interests are mainly application based -- how to apply different statistical techniques in different sectors to perform more accurate and precise analyses as well as projection. His core academic research areas are public health, education and machine learning. One of his primary goals concerning students is to assist them with technical knowledge to turn their thoughts into successful outcomes to form a modern society.