Mapping of Human Global Control System to Transportation and Logistics activity: review and synthesis

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Abstract
This paper objective is to perform a comprehensive analysis, mapping the main and secondary functions of human global control systems (HGCS) known well as Global positioning systems (GPS) in logistics and transportation starting from 2019 when COVID-19 affected the industry. The role of GPS in the world become highly significant in assisting humans and controlling the equipment involved in logistics and transportation in the world, especially in optimizing business. Regardless of the increasing interest from academicians and practitioners, there should be some limitations of the recent reviews describing the functions and possible trends of using the HGCS in the future. To fill the gap, the review used a systematic literature review and thematic analysis of 107 Scopus-indexed articles for tier Q1 and Q2 from 2019 to 2024. Based on the review, an integrative multidimensional framework based on the country study, main context, focus, and main to secondary function category. As a result this evaluation exposes essential trends in the article, author, nation, journal performance, and past, present, and future endorser research theme tendencies. Various research gaps are identified, and avenues for future research are proposed that reflect essential emerging areas and unexplored realms regarding the theory, methodology, and context framework that may useful for logistics and transportation industry continuity in the world.he abstract should be clear, concise, and descriptive.

Article History:

Keywords:
GPS, transportation, logistics, function, systematic literature review

1. Introduction

The logistics and transportation sector is a critical component of the global economy, enabling the efficient movement of goods and services. As the complexity and scale of this sector continue to grow, there is an increasing need to understand and map the function of the Human Global Control System (HGCS) within this domain. Despite the pivotal role of HGCS in logistics and transportation, a comprehensive review that synthesizes historical and future trends, maps key areas, and provides a framework for future research is conspicuously absent. Since 2019, there has been significant research and development related to HGCS in logistics and transportation, driven by advancements in technology, changes in consumer behavior, and global economic shifts. This period has seen the integration of artificial intelligence, machine learning, and data analytics into logistics operations, enhancing the efficiency and reliability of transportation networks. However, the rapid pace of change has also created gaps in our understanding of the broader implications and future directions of HGCS.

This paper aims to fill this gap by providing a comprehensive analysis and mapping of key areas within HGCS in logistics and transportation. Utilizing subject classification mapping, we will systematically review literature from 2019 onwards, identifying key themes, trends, and research gaps.

The analysis will be structured around two primary frameworks: Theoretical Methodological Context (TMC) and Antecedent Decision Outcome (ADO). The TMC framework will help in understanding the theoretical underpinnings and methodological approaches used in the study of HGCS, while the ADO framework will focus on the antecedents, decisions, and outcomes associated with HGCS applications in logistics and transportation. Through this comprehensive review, we aim to synthesize existing knowledge and identify historical and future trends. This will involve a detailed examination of how HGCS has evolved over time, its current state, and the anticipated future developments. Additionally, the paper will propose a future research agenda, highlighting areas that require further investigation and offering insights into potential new directions for research. In summary, this paper seeks to provide a detailed mapping of the function of the Human Global Control System in logistics and transportation, drawing on recent research developments, comprehensive analysis, and subject classification mapping. By doing so, it aims to contribute to the existing body of knowledge, address current research gaps, and set the stage for future research in this vital area.

2. Literature Review

Global Positioning Systems

Global Positioning Systems (GPS) have fundamentally transformed logistics and transportation, providing precise location tracking, route optimization, and enhanced fleet management capabilities. This literature review explores various applications and theoretical underpinnings of GPS technology in the context of logistics and transportation, drawing on a range of studies from recent years. (Pérez-González et al., 2024) present a method for predicting travel times in emerging markets using anonymous truck GPS data. Their research highlights the value of GPS data in understanding and predicting traffic patterns in regions with less developed infrastructure. By leveraging vast amounts of GPS data, the authors demonstrate improved accuracy in travel time predictions, which is crucial for logistics efficiency and reliability in emerging markets. Although (Patel et al., 2021) focus on the development of a multiband antenna for wireless communications, the implications for GPS technology are significant. Enhanced wireless communication technologies support more reliable and accurate GPS data transmission, essential for real-time tracking and logistics management. This study indirectly underscores the importance of robust communication systems in the effectiveness of GPS-based applications in logistics. (Huk & Kurowski, 2022) explore the innovations in vehicle tracking technologies, emphasizing the advancements enabled by GPS. Their research outlines how GPS has evolved from basic location tracking to sophisticated systems that integrate real-time data analytics, enhancing operational efficiency and strategic decision-making processes in transport and forwarding industries. (Bao et al., 2019) utilize GPS data as part of a spatiotemporal deep learning approach to predict short-term crash risks. The integration of GPS with other data sources allows for a more comprehensive analysis of traffic conditions and potential hazards. This study illustrates the critical role of GPS in enhancing road safety and planning through predictive analytics. (Stipancic et al., 2019) employ GPS data to screen urban road networks and model crash frequency and severity. Their approach demonstrates how GPS data can be used to identify high-risk areas and develop targeted interventions to reduce accidents. This research contributes to the broader understanding of GPS applications in urban transportation safety management. (Bella & Gulisano, 2020) use GPS data to develop a hazard-based model for understanding motorcyclists' overtaking duration. The study provides insights into driver behavior and road safety, showcasing the versatility of GPS data in behavioral analysis and risk assessment in transportation. (Ahn et al., 2022) investigate the integration of off-site and on-site construction schedules using GPS-enabled fleet dispatching. The study highlights the role of GPS in coordinating complex logistics operations, ensuring timely delivery of materials and optimizing construction workflows. (Hill et al., 2022) document environmental changes using GPS technology in Antarctica. While not directly related to logistics, this study exemplifies the precision and reliability of GPS in tracking and monitoring changes over vast and challenging terrains, which has parallels in logistics applications in remote and difficult-to-access areas. (Thodberg et al., 2022) use GPS data to monitor temperature conditions during the transportation of livestock. Their research underscores the importance of GPS in ensuring compliance with animal welfare standards and optimizing transport conditions to reduce stress and improve efficiency. (Brusselaers et al., 2023) utilize GPS data to measure the environmental impact of heavy goods vehicle (HGV) traffic related to construction activities in urban

areas. The synthesis of the literature underscores the multifaceted role of GPS as a human global control system in logistics and transportation. From predicting travel times and enhancing communication to enabling sophisticated vehicle tracking and ensuring compliance with safety and environmental standards, GPS technology is integral to modern logistics. These studies collectively highlight the transformative potential of GPS, driving efficiency, safety, and sustainability in global transportation networks.

GPS and Transportation

Global Positioning Systems (GPS) have revolutionized the field of transportation by providing precise location tracking, route optimization, and fleet management solutions. This literature review synthesizes the theoretical underpinnings and definitions of GPS in transportation, drawing from a diverse range of studies. (Liu et al., 2022) focus on cold energy storage systems for smart cold chain logistics, incorporating GPS for tracking and monitoring. The theory emphasizes the integration of advanced energy storage solutions with GPS technology to ensure the efficient and safe transport of temperature-sensitive goods. (Chen et al., 2021) discuss real-time logistics management using IoT infrastructure and big data analytics, with GPS as a key component. The transportation theory highlights the role of GPS in enabling real-time data collection and analysis, which enhances decision-making and operational efficiency in logistics 4.0. (Wang et al., 2023) investigate the relationship between noise exposure during commutes and stress levels, using GPS data for analysis. The theory involves using GPS to study the environmental factors affecting commuter health and well-being, providing insights for improving urban transport system. (Adam et al., 2021) use GPS traces to analyze spatial interactions and geographical structures in Belgium. The transportation theory here focuses on the application of GPS data to understand and optimize logistics networks, revealing patterns that can inform better infrastructure and route planning. (Trent & Joubert, 2022) examine logistics sprawl and changes in freight transport activity, comparing methodologies that include GPS data. The theory highlights the impact of urban sprawl on logistics efficiency and the role of GPS in tracking and managing these changes to mitigate negative effects. (Li, 2021) discusses the development of a cold chain logistics system using 5G and IoT, with GPS as a critical component. The transportation theory emphasizes the synergy between GPS and emerging technologies like 5G to enhance the monitoring and management of cold chain logistics. (Zong et al., 2019) use multi-day GPS data to predict trip destinations. The theory involves leveraging GPS data to understand travel behavior and predict future movements, supporting more efficient route planning and traffic management. (D'Amico et al., 2021) proposes a framework for smart and sustainable logistics in port cities, with GPS playing a key role in tracking and optimizing logistics operations. The transportation theory focuses on using GPS to achieve sustainability goals and improve the efficiency of port logistics. (Azad et al., 2023) evaluate the sustainability of using e-trikes for urban delivery, incorporating GPS data in their analysis. The theory involves using GPS to monitor and optimize the deployment of e-trikes, supporting sustainable urban logistics solutions. (Cedillo-Campos et al., 2019)Cedillo-Campos et al. (2019) measure travel time reliability using GPS data, applying a freight fluidity approach. The theory emphasizes the importance of GPS in providing accurate travel time data to enhance the reliability and predictability of road transportation, crucial for efficient freight logistics.

Transportation theory, as illuminated by various studies, emphasizes the transformative role of GPS technology in enhancing logistics efficiency, safety, and sustainability. GPS enables precise location tracking, real-time data collection, and route optimization, crucial for effective fleet management and logistics operations (Chen et al., 2021). The integration of GPS with advanced technologies, such as 5G and IoT, ensures the efficient transport of temperature-sensitive goods in cold chain logistics (Li, 2021; Liu et al., 2022). GPS data is pivotal in analyzing spatial interactions and geographical structures to optimize logistics networks (Adam et al., 2021), managing logistics sprawl (Trent & Joubert, 2022) , and predicting travel behavior for better route planning (Zong et al., 2019). Furthermore, GPS supports sustainable urban logistics by optimizing the deployment of eco-friendly transportation solutions like e-trikes (Azad et al., 2023) and enhances road transportation reliability through accurate travel time measurements (Cedillo-Campos et al., 2019). Overall, transportation theory underscores the critical role of GPS in advancing the efficiency, reliability, and sustainability of modern logistics systems

GPS and Logistics

(Pérez-González et al., 2024) a logistics theory centered on utilizing big data and machine learning to predict travel times in regions with underdeveloped transportation infrastructure. By leveraging anonymous truck GPS data, the theory underscores the importance of real-time data collection and analysis for enhancing route planning, reducing delays, and optimizing overall logistics operations. (Patel et al., 2021) logistics theory implies the critical role of advanced communication technologies in logistics. Multiband antennas improve GPS accuracy and data transmission reliability, which are essential for effective vehicle tracking, fleet management, and real-time decision-making in logistics. (Huk & Kurowski, 2022) s the logistics theory that continuous advancements in vehicle tracking technologies are crucial for enhancing the efficiency and transparency of transport and forwarding operations. Innovations in GPS and related technologies enable better route optimization, timely deliveries, and improved fleet management. (Bao et al., 2019) The logistics theory here integrates spatiotemporal deep learning models with multi-source data, including GPS, to predict crash risks. This approach aids in developing safer and more efficient transportation networks, allowing for proactive management and reducing the likelihood of accidents, thereby ensuring smoother logistics operations. Stipancic et al. contribute to logistics theory by demonstrating the use of GPS data to identify high-risk areas in urban road networks. This enables targeted interventions to improve road safety, thus ensuring more reliable and safer logistics operations in urban environments. (Bella & Gulisano, 2020) introduces a logistics theory focusing on the use of GPS data to understand and mitigate risks associated with motorcyclist overtaking maneuvers. By analyzing overtaking durations and hazards, the theory aims to enhance road safety and reduce disruptions in logistics operations involving motorcycles. (Ahn et al., 2022) propose a logistics theory that integrates construction scheduling with fleet dispatching, supported by GPS tracking. This approach optimizes construction logistics, ensuring timely deliveries of materials and efficient coordination between off-site and on-site activities. (Hill et al., 2022) While not directly related to logistics, this study's use of GPS in extreme environments demonstrates the robustness and reliability of GPS technology, which can be applied to challenging logistics scenarios requiring precise tracking and data collection. (Thodberg et al., 2022) highlight a logistics theory where GPS data is used to monitor environmental conditions during transportation. This ensures compliance with animal welfare standards and maintains the quality of transported goods, emphasizing the importance of environmental monitoring in logistics.(Brusselaers et al., 2023) present a logistics theory that uses GPS data to assess and mitigate the environmental impact of heavy goods vehicle (HGV) traffic. This approach supports sustainable logistics practices by enabling the measurement and reduction of the environmental footprint of construction-related transportation activities. (Liu et al., 2022) propose a logistics theory integrating advanced cold energy storage solutions with GPS tracking. This combination ensures the efficient and safe transport of temperature-sensitive goods, highlighting the importance of integrating energy-efficient technologies with precise tracking in cold chain logistics. (Chen et al., 2021) discuss a logistics theory where IoT infrastructure and big data analytics, including GPS data, are used for real-time logistics management. This approach enhances decision-making and operational efficiency in Logistics 4.0 by providing accurate and timely information on freight travel times. (Wang et al., 2023) introduce a logistics theory focusing on the impact of environmental factors, such as noise, on commuter stress levels. Using GPS data, the study provides insights for improving the design and management of urban transport systems to enhance commuter well-being. (Adam et al., 2021) propose a logistics theory that uses GPS traces to analyze spatial interactions and geographical structures. This approach helps optimize logistics networks by revealing patterns and dynamics that can inform better infrastructure and route planning. (Trent & Joubert, 2022) examine logistics sprawl and its impact on freight transport activity. Their logistics theory compares different methodologies, including GPS data, to measure changes in freight activity and develop strategies to manage logistics sprawl effectively. (Li, 2021) discusses a logistics theory that combines 5G and IoT with GPS tracking to develop an advanced cold chain logistics system. This integration enhances the monitoring and management of temperature-sensitive goods, ensuring their safety and quality during transport. (Zong et al., 2019) present a logistics theory leveraging multi-day GPS data to predict trip destinations. This predictive approach supports more efficient route planning and traffic management by anticipating travel patterns and optimizing logistics operations accordingly. (D'Amico et al., 2021) proposes a logistics theory that focuses on smart and sustainable logistics practices in port cities. Using GPS tracking, the framework aims to optimize

logistics operations, reduce environmental impacts, and achieve sustainability goals in urban port settings. (Azad et al., 2023) introduce a logistics theory that evaluates the sustainability of e-trikes for urban delivery using GPS data. This approach supports the adoption of environmentally friendly transportation options in urban logistics, reducing emissions and improving efficiency. (Cedillo-Campos et al., 2019) discuss a logistics theory that uses GPS data to measure travel time reliability in road transportation. Their freight fluidity approach emphasizes the importance of accurate travel time data for improving the predictability and efficiency of logistics operations.

Logistics theory, as synthesized from recent literature, underscores the transformative impact of GPS technology on logistics and transportation. GPS enables real-time data collection and analysis, crucial for enhancing route planning, reducing delays, and optimizing overall logistics operations (Huk & Kurowski, 2022; Pérez-González et al., 2024). The integration of advanced communication technologies, such as multiband antennas, enhances GPS accuracy and data transmission, facilitating effective vehicle tracking and fleet management (Patel et al., 2021). By incorporating spatiotemporal deep learning models with multi-source data, GPS aids in predicting crash risks and ensuring safer transportation networks (Bao et al., 2019). GPS data is also pivotal in identifying high-risk urban road areas, allowing for targeted safety interventions (Stipancic et al., 2019). In cold chain logistics, GPS combined with advanced energy storage and IoT technologies ensures the efficient and safe transport of temperature-sensitive goods (Li, 2021; Liu et al., 2022). Furthermore, GPS tracking supports sustainable logistics practices by assessing and mitigating the environmental impact of heavy goods vehicle traffic and promoting the use of eco-friendly transportation options like e-trikes (Brusselaers et al., 2023; Azad et al., 2023). Overall, logistics theory highlights the essential role of GPS in enhancing operational efficiency, safety, sustainability, and real-time decision-making in modern logistics systems.

3. Method

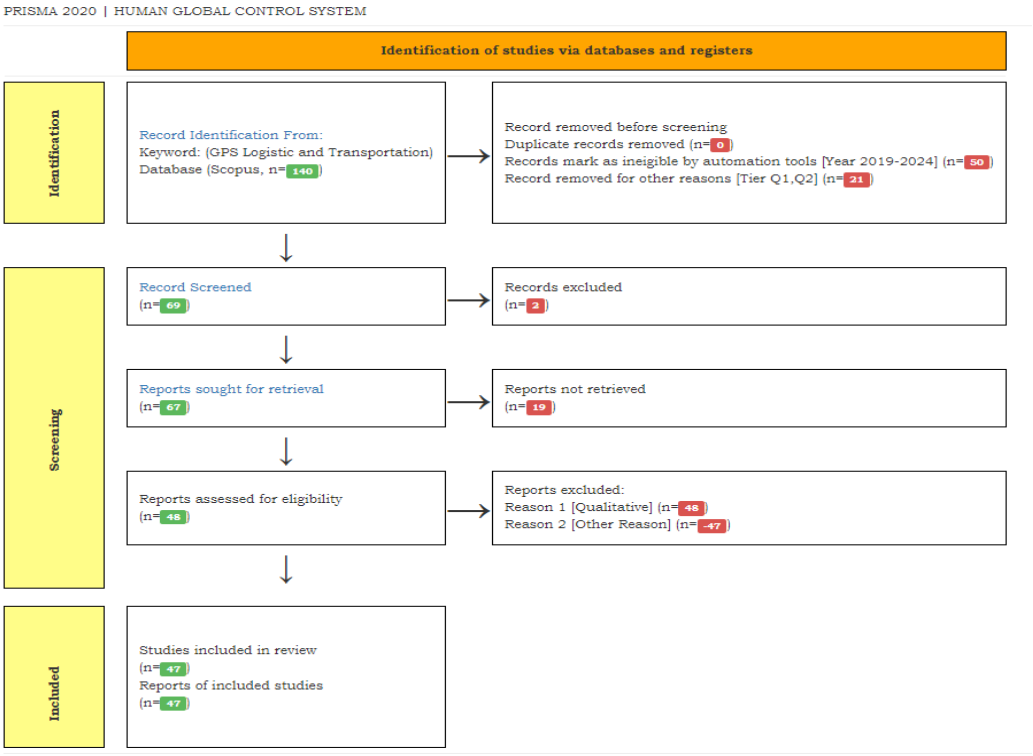
This study comprises two main components: a comprehensive literature review followed by supplementary data analysis and discussion, as outlined by (Göcke et al., 2022) and (Waqas et al., 2021). The research adhered to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines, as proposed by (Moher et al., 2009). The utilization of PRISMA in this study is justified due to its wide acceptance as a rigorous systematic review protocol, as noted by (Panic et al., 2013). Moreover, PRISMA is commonly adopted in the fields of business and marketing, as highlighted by (Siddaway et al., 2019). This systematic literature review, conducted using the Watase Uake System, follows a structured process: 1) Identification of keywords, criteria, and limitations; 2) Screening of relevant articles; 3) Search for articles from selected sources and potential exclusions; 4)Review of titles, abstracts, and keywords of the selected articles; 5) Compilation of relevant information and items from each selected article during the extraction process; 6) Analysis of classification, network patterns, network hypotheses, and visualization. The Scopus database was chosen for this research due to its robust indexing and extensive citation coverage, as corroborated by (Rocha et al., 2020). As (Norris & Oppenheim, 2007) assert, Scopus offers superior coverage of social science literature compared to other databases. Its repository is widely accessed and esteemed for empirical and quantitative research, as evidenced by (Farrukh et al., 2020). Consequently, Scopus has emerged as an indispensable tool in the realm of social science research.

The data for this study were collected in May 2024, employing specific search keywords such as "GPS," "Logistics," and "Transportation" within the "article title, abstract, or keywords" fields. These keywords were thoughtfully selected to encompass articles related to the main and secondary functions of GPS in the Logistics and Transportation domain. The inclusion criteria applied were: • Publication in scholarly journals; • Publication between 2019 and 2023; • Scopus journal quartiles Q1 to Q2.

After applying these criteria, a total of 140 articles remained. Subsequently, these articles' titles and abstracts underwent a thorough review to create a comprehensive table and facilitate content analysis. Following this evaluation, 47 papers were excluded either due to their lack of direct relevance to celebrity endorsement or duplication. The resulting database comprised 47 articles (see Figure 1). A statistical analysis was conducted using the collected data to determine various aspects, including the annual number of articles published on celebrity endorsement, trends in annual publication averages, the geographic focus of the studies, research methodologies employed, primary journals dedicated to

the topic, social media platforms investigated, types of endorsers, theoretical foundations, prolific authors in the field, and the most frequently cited references.

Figure 1
Prisma Diagram



4. Results and Discussion

4.1 Results

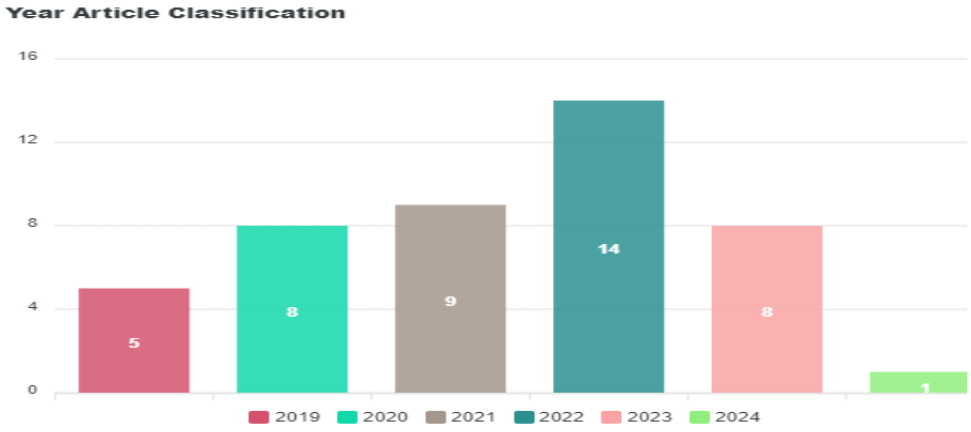
This section outlines the evolution of 47 identified research articles related to the Mapping the function of Human Global Control System in Logistics and Transportation. These articles have been categorized based on their publication year, the country where the research was conducted, the research methods employed, the primary journals in which they were published, the online strategy under examination, the theoretical foundations used, and citation analysis. Subsequently, we will provide a comprehensive explanation of the insights gathered from these research profiles or papers. We will also address the limitations of the existing theories and conduct an analysis within the TMC framework to propose new avenues for future research in the concluding section.

Year of publication

As illustrated in Figure 1, the research output related to the Mapping the function of Human Global Control System in Logistics and Transportation exhibited a pattern of fluctuation during the years 2019 to 2023, with a relatively consistent range of 7 to 8 articles per year. However, the exceptional year of 2019-2020, marked by the global Covid-19 pandemic, witnessed a remarkable upsurge in scholarly activity, yielding a peak of 14 articles in 2022, subsequently there was a noticeable decline to 8 articles in 2023, followed by a substantial reduction to a mere 1 article in 2024. This intriguing data pattern suggests that the disruptive impact of the Covid-19 pandemic generated a surge in research interest and productivity within the field GPS as human global control system in Logistics and transportation starting 2019. Researchers likely sought to comprehend the profound transformations and challenges faced by these industries as they navigated the pandemic's uncertainties. However, the subsequent reduction in research output in the following years may reflect a shift in focus or perhaps a maturation of the initial

inquiries, warranting a closer examination of the content and themes of these articles to glean deeper insights into this intriguing phenomenon.

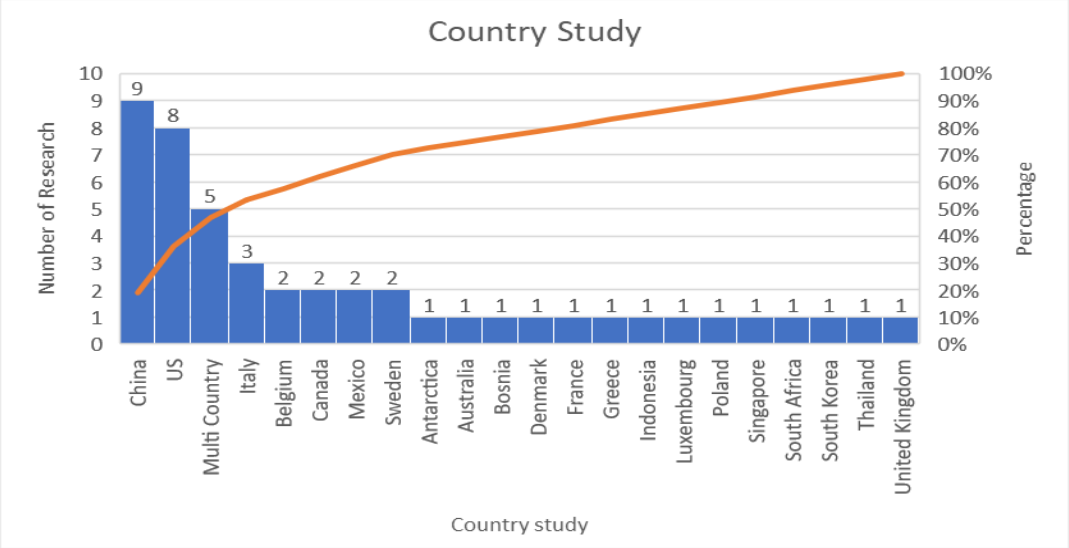
Figure 2
Yearly article classification



Country of study

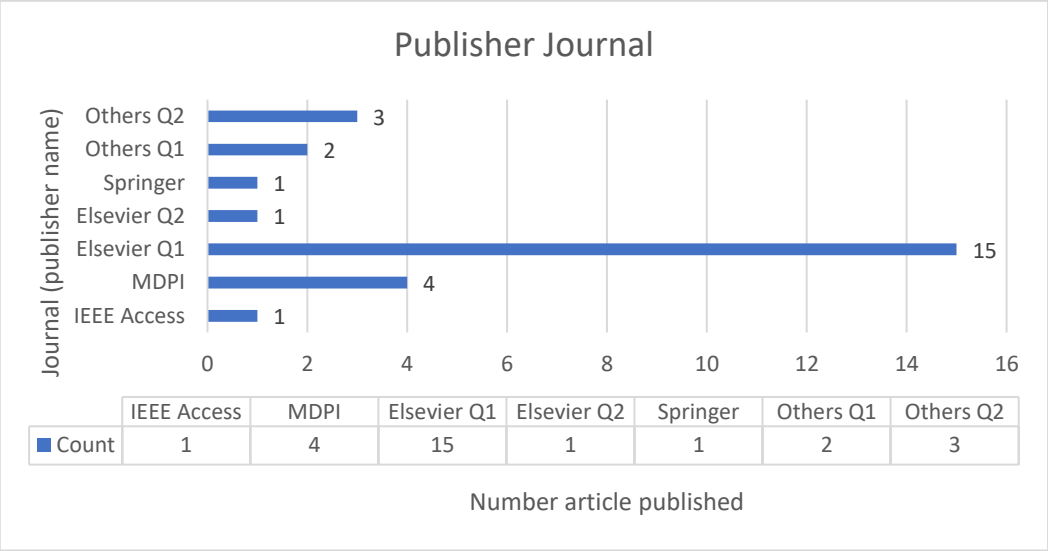
According to the data depicted in Figure 3, the majority of articles, totaling 47, indicate that research on GPS in logistics and transportation industry often encompasses multinational studies. China emerges as the second most prominent location for research in this field, with 9 articles, closely followed by United States with 8 articles, Multi Country with 5 articles, and Italy with 3 articles. Follow by Belgium, Canada, Mexico and Sweden each contribute 2 articles, while the rest 14 countries in Antartica to United Kingdom represented by 1 article. This data pattern underscores the global nature of research in Mapping the function of Human Global Control System in Logistics and Transportation, with a significant proportion of studies adopting a multinational perspective. The prominence of the China and US as research hubs reflects the diverse geographical origins of scholarship in this field. The prevalence of multinational studies suggests a recognition of the interconnectedness of the aviation and tourism industries across borders, highlighting the need for cross-cultural and cross-national perspectives to address the complexities and dynamics of online marketing strategies effectively. Further exploration of these articles can provide valuable insights into the specific countries or regions of focus and the implications for HGCS in Logistics and Transportation.

Figure 3
Country Study



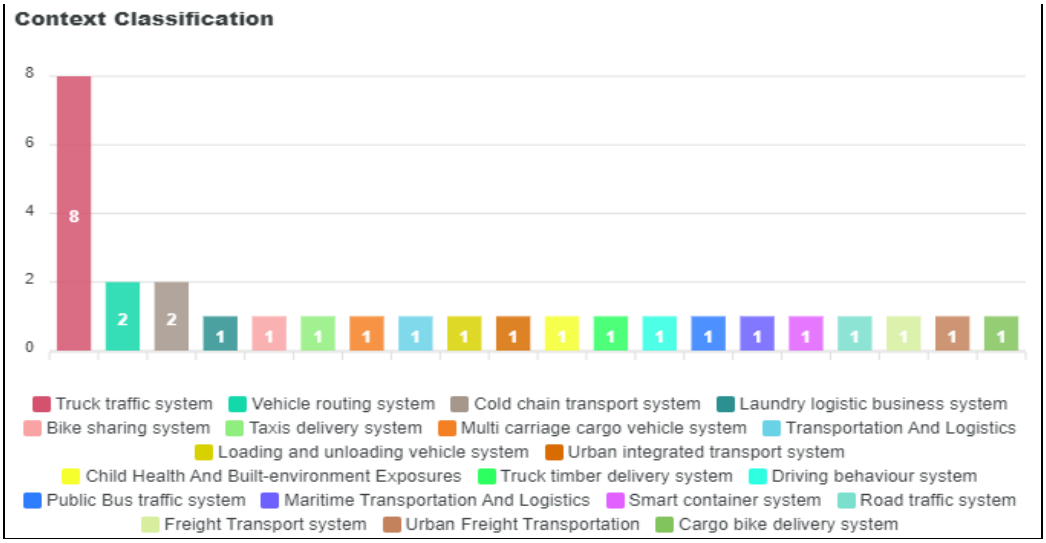
Major Publishing Journal
The major publishers is Elsevier and MDPI with 15 articles in Q1 and 1 in Q2, while MDPI is 4 article in Q1. The rest for other publisher, such as IEEE and Springer , etc

Figure 4
Major Publishing Journal



Context Study
There are 20 context of classification study for this HGCS , the first context prefer by the researcher is about Truck Traffic System , total 8 articles, follow by the Vehicle routing system, and Cold chain transport system with each 2 articles of the classification as describe on figure 5.

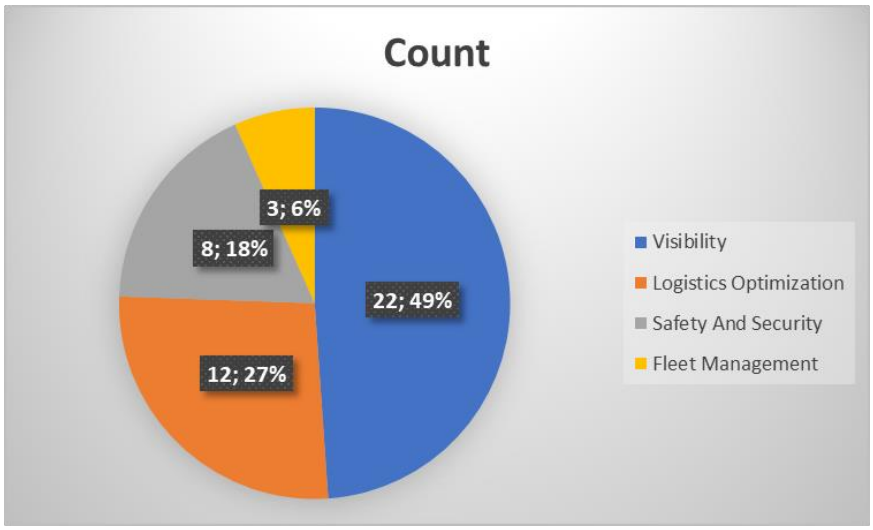
Figure 5
Context Classification on study



About the Classification Study
The classification study is the important one , when the we decided to devide the HGCS into 2 category function of HGBC , the first category is the main category and the second category is the subsidiary or secondary category. On the Main Category there are four main function of categories and the percentage

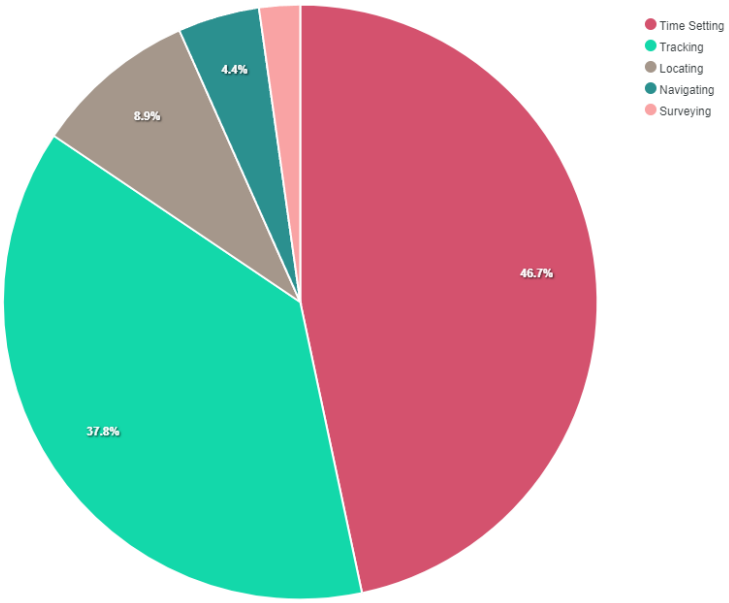
portion of each main function as follows : 1) Visibility (49%); 2) Logistics Optimization (27%); 3) Safety and security (18%); and 4) Fleet Management (6%), with configuration number 22:12:8: 3he discussion should explore the significance of the results of the work, not repeat them.

Figure 6.
Main function Category of HGCS



While for the secondary function category consist of 5 secondary functions and percentage portion as follows : 1) Time Setting (46,7%); 2) Tracking (37,8%); 3) Locating (8,9%) ; 4Navigating (4.4%) and 5) Surveying (2,2%), with total configuration number: 21:17:4:2:1.

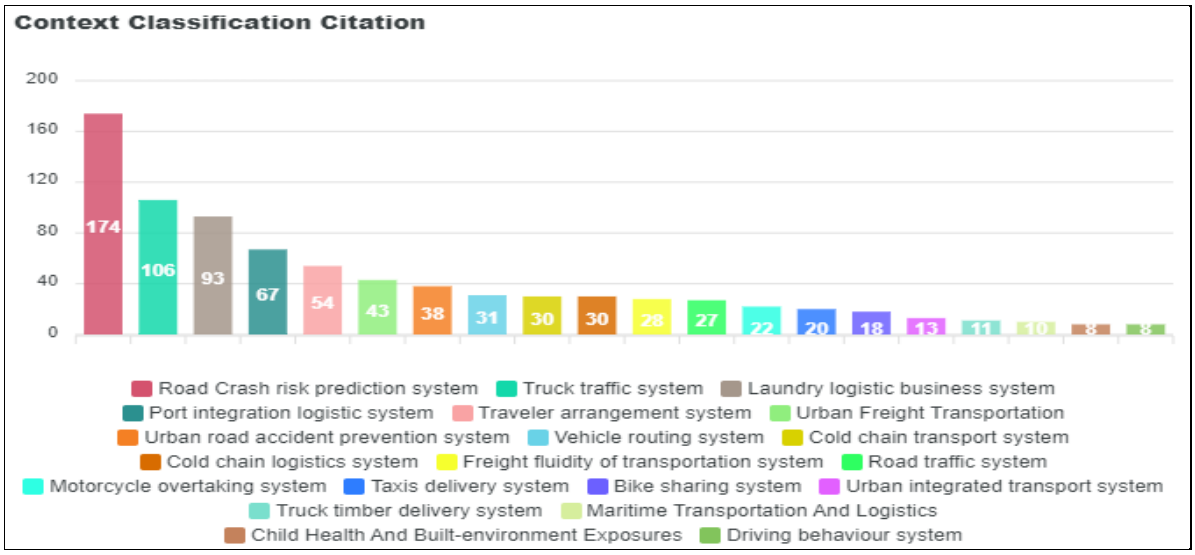
Figure 7
Subsidiary or secondary function of HGCS



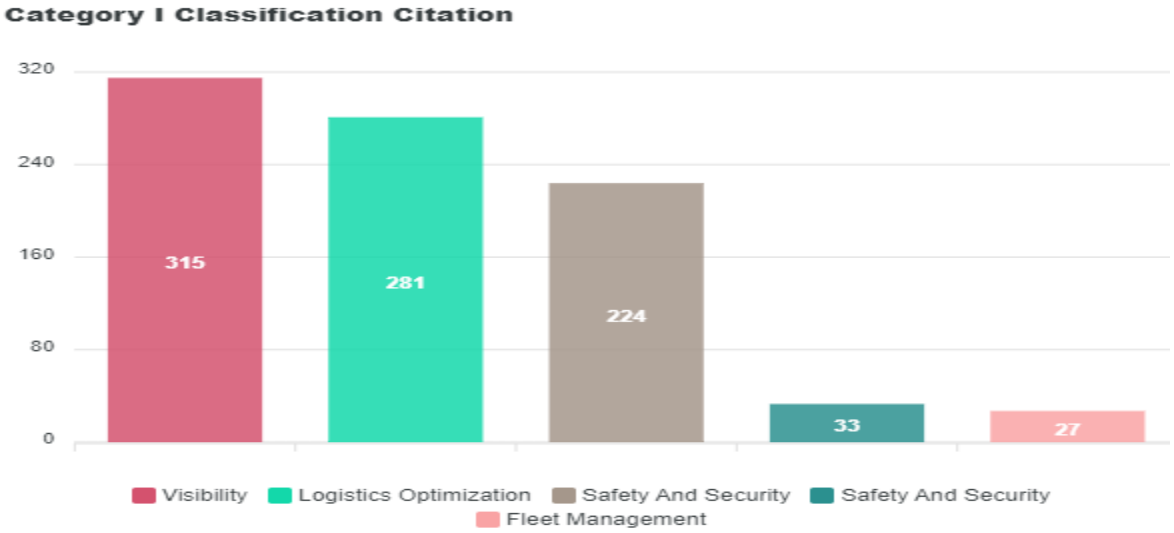
Citation Analysis
While the context classification based on the number of citation from the researcher is the context of Road Crash risk prediction system with total number 174 citations, follow by Truck traffic system

around 106 citation and Laundry logistic business system with total 93 citations, the rest context class has been citated start from 67 – to 8 citation per article , as per figure 8

Figure 8
Context Citation Analysis of HGCS

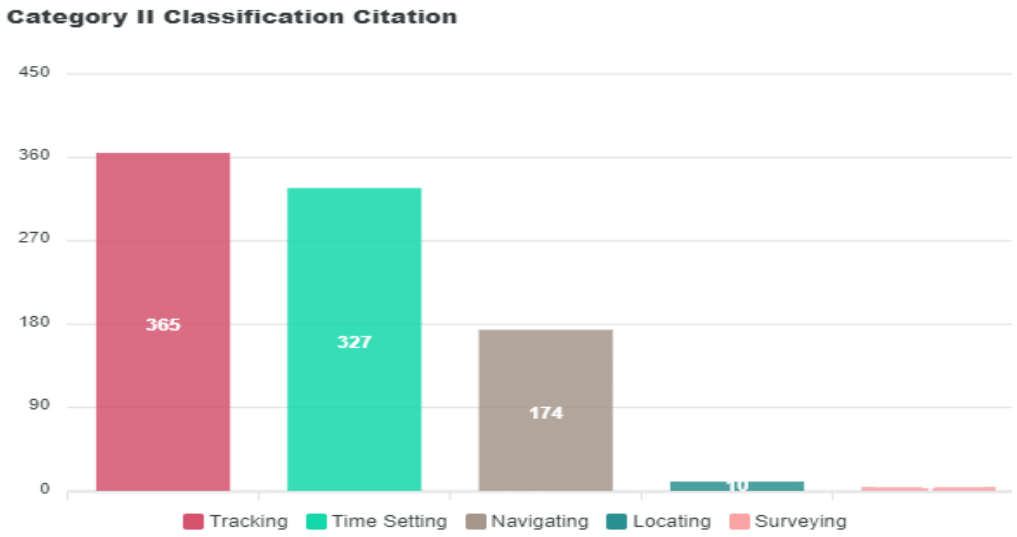


The main category citation , can be seen on figure 9
Figure 9
Main Category of Classification citation



The second category citation as follow :

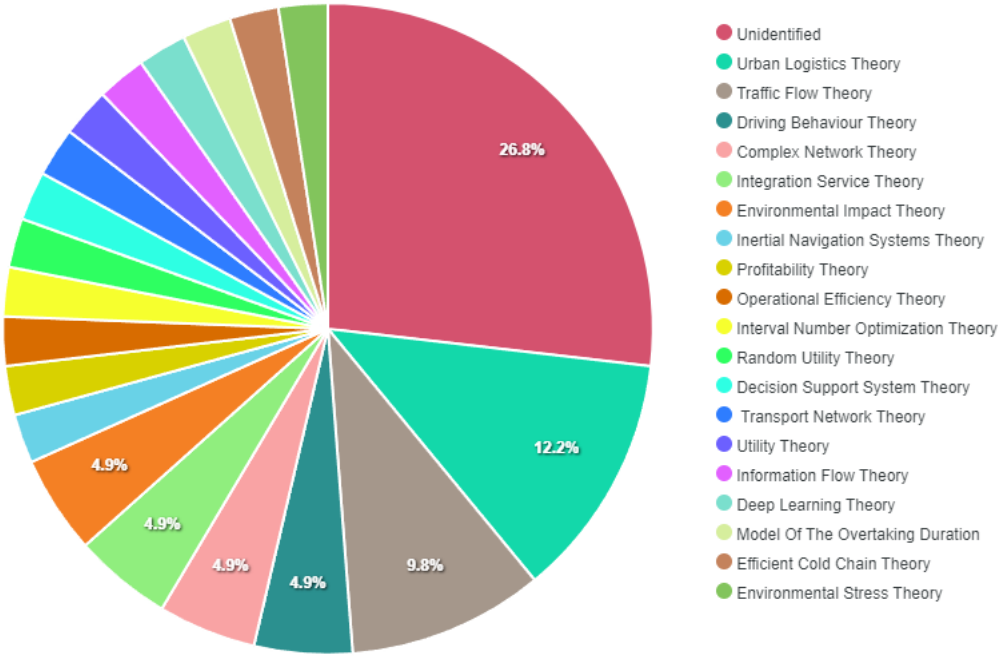
Figure 10
Second Category of Classification citation



Theoretical Foundation

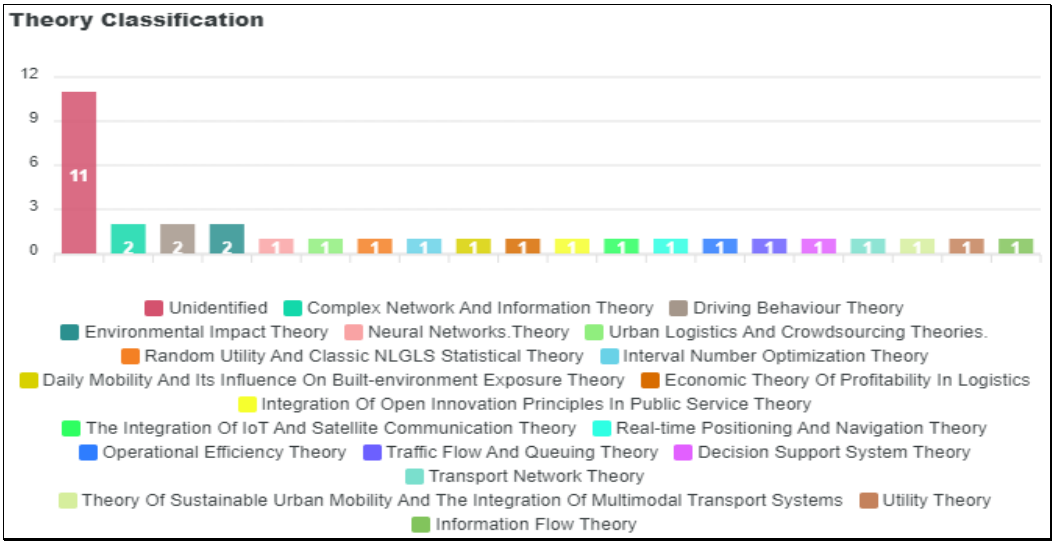
There are 20 grand theories as the foundation of HGCS in Logistics and transportation, with the sequence and percentage portion as follows : 1) Unidentified (26,8%): 2) Urban Logistic Theory (12,2%); 3) Traffic Flow Theory (9,8%) and 4) complex network theory; integration service theory; Environmental Impact Theory; each of the teories (4,9%), the rest of averagely 14 theories is 3%.

Figure 11
Portion percentage of 20 Grand theory of HGCS



While the number of grand theory can be seen on figure 12

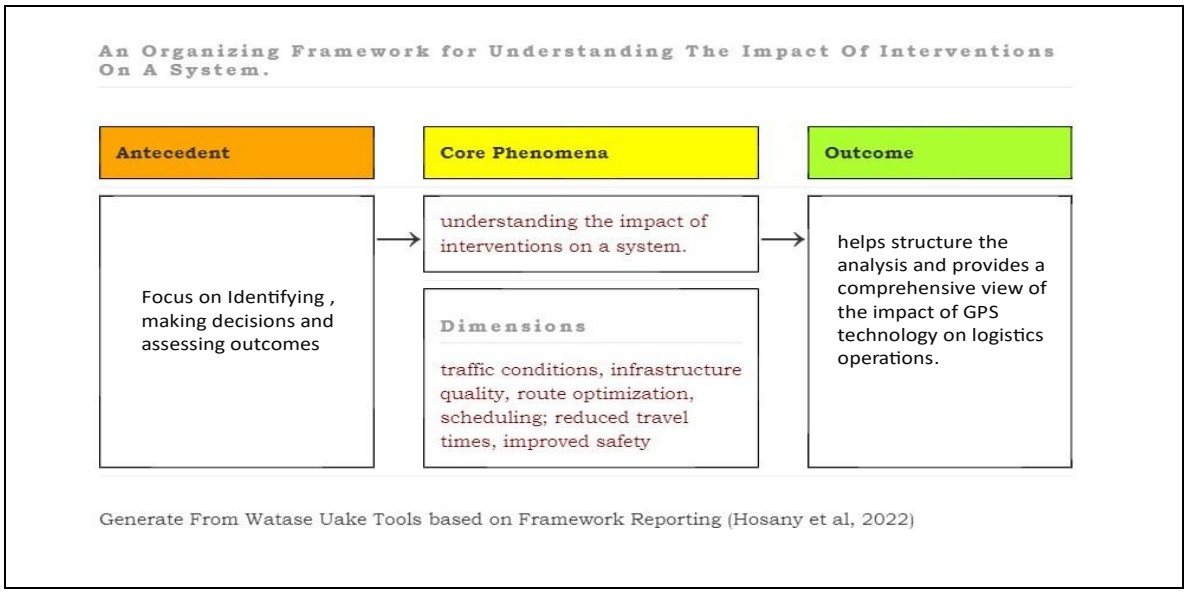
Figure 12
The number of Grand Theory for HGCS



Framework Analysis

General Framework analysis with core phenomenon is understanding the impact of interventions on a system. Theoretical Methodological Context (TMC), The studies reviewed apply the TMC framework by integrating theoretical models with empirical GPS data analysis. This approach facilitates a deeper understanding of the underlying mechanisms driving logistics and transportation phenomena, enabling the development of more effective predictive models and decision-making tools. Antecedent Decision Outcome (ADO), The ADO framework is evident in the studies' focus on identifying antecedents (e.g., traffic conditions, infrastructure quality), making informed decisions (e.g., route optimization, scheduling), and assessing outcomes (e.g., reduced travel times, improved safety). This framework helps structure the analysis and provides a comprehensive view of the impact of GPS technology on logistics operations

Figure 13
General Framework



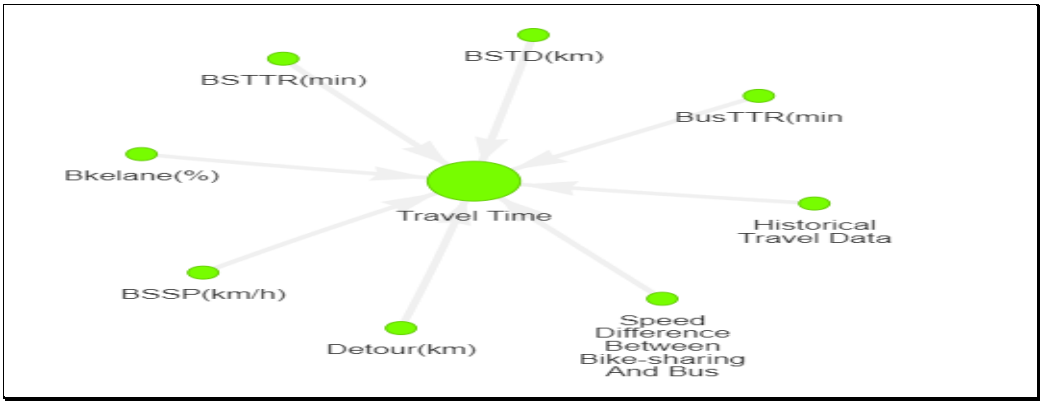
Hypothesis Network.

There are 3 big hypothesis network on this paper, start from 1) Commercial Vehicles Cruise for parking which is affected by 14 independent variables as per figure 14 below:

Figure 14
Hypothesis 1 Commercial Vehicles Cruise for Parking

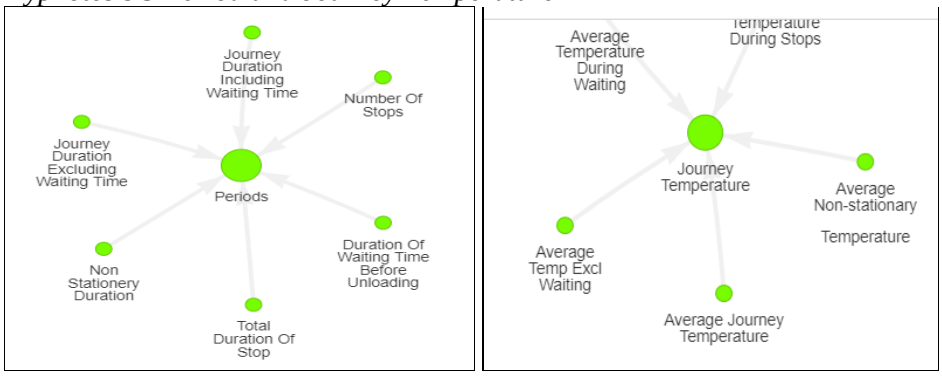
Follow by 2) Travel Time which is affected by 8 independent variables as per figure 15 below

Figure 15
Hypothesis 2 Travel Time



Then the 3rd hypothesis is The periods which is affected by 6 independent variables, and the Journey temperature which is affected by 5 independent variables as per figure 16 below

Figure 16
Hyphotesis 3 Period and Journey Temperature



4.2 Discussion

Organization Codes

Antecedent, Decision, Outcome, Country, Theory, etc
Below is the antecedent, core phenomenon (situational awareness), and dimensions of the "Visibility and Tracking" category in the HGCS lead to the desired outcome:
Antecedent: Lack of clear or complete information about location and status of things in a complex global system. Core Phenomenon: Improved situational awareness through increased visibility and tracking.Dimensions:• Scope: Tracking physical location, status, and relevant environmental factors; • Data Types: Combining visual, sensor, and identification data; •Temporal Resolution: Frequent data updates (ideally real-time or near real-time); • Accessibility: Providing access to relevant personnel in the HGCS

Outcome: By addressing the antecedent through these dimensions, the outcome is achieved:
•Enhanced decision-making: With a clearer picture of the overall situation (improved situational awareness), humans can make more informed decisions across various aspects of the HGCS, including: 1) Logistics optimization: Efficiently managing routes, schedules, and resource allocation based on real-time tracking data; 2) Improved safety and security: Identifying and addressing potential risks or hazards by monitoring object status and environmental factors; 3) Faster response times: Reacting quickly to emergencies or disruptions due to real-time information on location and status; 4) Increased efficiency: Optimizing resource utilization and overall system performance based on accurate data; 5) Improved collaboration: Sharing tracking data across different stakeholders within the HGCS allows for better coordination and communication.

Overall, the ADO framework with its focus on visibility and tracking, along with its various dimensions, leads to a more informed and efficient Human Global Control System. So the outcome, enhanced decision making: with a clearer picture of the overall situation , humans can make more informed decisions across various aspects of the HGCS , including : logistics optimization, Improve safety and security, Faster response times, increased efficiency, and improved collaboration. There are at least 21 country study and multi country, Lead by China and US as super power country or big country, followed by European country and other Asian country including Indonesia.

The major theory is related Urban Logistic Theory and Traffic Flow Theory from 20 theories taken from the articles citated. The most method used on the research of HGCS is Experiment and Case study followed by systematic review and survey. Research design classification , many on Mixed method and quantitative followed by Empirical study using real-world data Simulation of freight operations with a hypothetical electric vehicle fleet also Empirical study using GPS data to observe and analyze commercial vehicle cruising behavior.

Organization Framework
Using 3W1H: What, Where, How, and Why (Billore and Anisimova's, 2021)
Based on the content and objectives of the paper titled "Mapping the function of Human Global Control System in Logistics and Transportation: review and synthesis," here is a suggested framework for organizing literature review questions (LRQ) using the 3W1H approach at leasty there are 12 LRQ could be arisen to discuss the HGCS in Logistics and transportation:

For What LRQ
1. What are the primary and secondary functions of Human Global Control Systems (HGCS) in logistics and transportation? - Explore various roles and applications of HGCS/GPS in this field.
2. What are the key technological advancements in HGCS/GPS since 2019 that have impacted logistics and transportation? - Investigate innovations and their implications for the industry.
3. What are the major challenges and limitations of current HGCS/GPS implementations in logistics and transportation? - Identify obstacles faced by the industry in adopting these technologies.

For Where LRQ
4. Where are the significant geographical regions or countries that have effectively utilized HGCS/GPS in logistics and transportation?-Highlight case studies or examples from specific countries.

5. Where in the logistics and transportation supply chain is HGCS/GPS most effectively implemented? - Examine the specific segments (e.g., last-mile delivery, fleet management) where these systems are used.
6. Where are the research gaps in the current literature on HGCS/GPS in logistics and transportation? - Identify areas that need further exploration and study.

For How LRQ

7. How has the integration of HGCS/GPS with other technologies (e.g., AI, IoT) improved logistics and transportation? - Assess the synergistic effects of combining these technologies.
8. How do HGCS/GPS contribute to optimizing logistics operations and improving efficiency? - Examine specific processes or metrics improved by these systems.
9. How have different sectors within logistics and transportation (e.g., cold chain, urban transport) benefited from HGCS/GPS? - Explore sector-specific benefits and applications.

For Why LRQ

10. Why is there a growing interest in HGCS/GPS for logistics and transportation post-2019? - Investigate the drivers behind the increased focus on these technologies.
11. Why are certain regions or industries lagging in the adoption of HGCS/GPS despite their benefits? - Explore reasons for slow adoption in specific areas.
12. Why is it essential to map the functions and trends of HGCS/GPS in logistics and transportation now? - Discuss the importance of this research in the current global context.

This framework ensures a comprehensive and organized approach to reviewing the literature, addressing key aspects of HGCS/GPS in logistics and transportation from multiple perspectives.

5. Conclusion

This research achieved its primary aim of analyzing and mapping the functions of Human Global Control Systems (HGCS) within the logistics and transportation sectors. By employing a systematic review of high-quality Scopus-indexed literature, we identified key roles of HGCS, particularly through the use of GPS, in enhancing visibility, logistics optimization, safety, and fleet management. The integrative framework developed in this study provides a comprehensive understanding of the core and secondary functions of HGCS, advancing the current knowledge and offering a structured approach for further exploration of these technologies.

The findings underscore the transformative impact of HGCS on modern logistics by leveraging real-time data for improved decision-making, operational efficiency, and safety. The integration of GPS with emerging technologies like AI and IoT has shown potential in optimizing route planning, reducing risks, and supporting sustainable logistics operations. This study contributes to the field by identifying critical trends and research gaps, particularly in areas such as cold chain logistics and predictive safety analytics, where further advancements could lead to significant improvements.

Looking ahead, future research should focus on enhancing the integration of HGCS with cutting-edge technologies, expanding studies into regions with less developed infrastructure, and exploring the environmental implications of these systems. Investigating these areas could help bridge existing knowledge gaps and pave the way for more adaptive, efficient, and sustainable logistics networks. This study lays a strong foundation for continued innovation in the use of HGCS, providing valuable insights for academics and industry practitioners aiming to optimize logistics and transportation systems globally.

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