Institution Logics of MaaS Implementation in Shanghai Municipality

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Abstract

As an innovative model of smart transportation, the concept, prospects, and challenges of Mobility as a Service (MaaS) have been extensively studied. However, how organizational logic and specific contexts influence its practice lack attention. The study employs institutional logic theory to conduct an empirical research of MaaS implementation by the Shanghai municipal government. The findings reveal that MaaS implementation in Shanghai is the result of a hybrid institutional logic, reflecting pluralistic characteristics of China's deepening market-oriented reforms. Specifically, Shanghai's MaaS implementation demonstrates the coexistence of New Public Management (NPM) and New Public Governance (NPG) as dominant logic, while Traditional Public Administration (TPA) logic remains the foundation of policy-making. The study provides evidence of how specific contexts influence MaaS implementation, addressing the current research gap in non-European regions and offering new insights into the relationship between MaaS implementation and sustainable urban development.

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1. Introduction

With the development of people's lifestyles, smart transportation is facing new demands and challenges while smart mobility offers new solutions in such a process. In addition, smart mobility plays an important role in promoting sustainable development. Because smart mobility solves traffic congestion, reduces the use of private cars, and thus contributes to pollution abatement (Butler et al., 2021). However, at the governance level, the existing governance model cannot adapt to the new demands in the field of mobility (Jittrapirom et al., 2017). It means that people's demand for transportation is constantly escalating, from the basic need for "owning transportation" in the past to the quality needs of time, environment, transfer, services, and other aspects (Bıyık et al., 2021). These changes have led to the birth of a new concept in the mobile field called "Mobility as a Service"(MaaS).

MaaS is to integrate various forms of transportation services into a single travel complex that can be accessed on demand (MaaS Alliance, 2017). There have been many studies that focused on the prospects and challenges of MaaS (Alyavina et al., 2022; Jang et al., 2021; Pangbourne et al., 2018; Zawieska & Pieriegud, 2018). However, only a few studies emphasize the specific background of the implementation of the MaaS concept and point out the importance of adapting to local conditions for MaaS implementation, including existing routines of city government (Butler et al., 2021). In this sense, while the previous studies stress that public sector in general, especially local governments play important role in MaaS implementation, the analysis of their motivations and internal rationales remain somewhat limited.

Due to the aforementioned research gap, this study aims to elucidate the relationship between specific government contexts and MaaS implementation. It chooses Shanghai as the case study because its MaaS development is leading in China but still strong role of the state in such initiative. In addition, there is limited literature on MaaS research in Shanghai and its government tradition in relation to MaaS. And there is not much literature to answer the question about how the influence of specific context will have when it comes to the MaaS implementation, including its causes, external pressures, and the comprehensive impact of internal governance logic. Based on this, it would be interesting to further explore how the MaaS concept is implemented in specific context.

Institutional Logic (Hughes, 2017; Massey, 1993; Ostrom, 1990; Thornton et al., 2012) as theories applied in this research. In order to analyze the internal governance logic of MaaS implemented by the Shanghai municipal government, three institutional logic are introduced in this study: traditional public administration, new public management and new public governance. As data sources, official documents and reliable media reports on the Internet is selected. In terms of research methods, this study mainly depends on qualitative analysis with minor combination of quantitative one. Based on the theoretical framework and in consideration that the study involves case study of Shanghai, relevant evidence in these documents is collected to answer the research questions.

2. Literature Review

2.1 The Definition and Core Elements of MaaS

The concept of MaaS was firstly raised by Sampo Hitanin in 2014, it is considered to be a new mobility model that can meet the service needs of travelers, and this model is met through the interface provided by service providers (Hietanen, 2014). In 2017, the MaaS Alliance proposed the widely accepted definition of MaaS in its white paper, Mobility as a service (MaaS) is to integrate various forms of transportation services into a single travel service that can be accessed on demand (MaaS Alliance, 2017). After that, the

definition of MaaS is still evolving. Some scholars (Smith & Hensher, 2020) hold the opinion that MaaS is a medium to access services including information search, reservation, payment and planning, rather than the sum of them. Therefore, MaaS can be understood as a service type that enables users to plan, subscribe and pay for multiple types of mobile services through joint digital channels.

In addition to the definition of MaaS, many scholars have discussed the main characteristics of MaaS. Alyavina et al. (2022) summarize these ideas into eight core elements of MaaS.[1] Alternatively, other scholars believe that MaaS system should include five core elements, including: a single service platform, multiple travel modes covering public and private transport, real-time query of multi-mode travel information, customized travel packages, integration of multi-mode travel path planning and payment methods (Liu et al., 2019).

2.2 The Prospects and Challenges of MaaS

Existing research on the development status and prospects of Mobility as a Service (MaaS) shows great interest, leading to the emergence of two research perspectives. The first perspective involves MaaS's contributions to smart mobility and sustainable development. As an innovative strategy of smart mobility, MaaS is considered to promote the sustainable development, public transport and urban governance. It can also improve sustainable transportation systems (Jang et al., 2021). Because the bundles of services provided by MaaS will reduce consumer demand for private cars, or even delay and eventually stop car purchases, thus improving sustainable transportation. Pangbourne et al. (2018) proposed an analysis of MaaS to assess its potential impact on urban decision makers in terms of governance and sustainability. They emphasizes that MaaS is not a fixed commodity, but a conceptual way to provide services to customer. Zawieska and Pieriegud (2018) analyzed the relationship between the deployment of the smart city concept and the concept of sustainable mobility. The authors also analyzed the impact of carbon dioxide released by smart city components as a determinant of mobility. Smith and Hensher (2020) believed that the development and diffusion of MaaS could be conceptualized as an attempt to transform the personal mobility system from fragmentation to polycentricity, with the aim of obtaining public benefits by changing the fragmentation.

The second research perspective focuses on the challenges encountered during the implementation of MaaS. Effective collaboration among stakeholders is considered a key factor in determining the success of MaaS implementation. Strömberg et al. (2018) point out conflicts between public and private sectors in terms of goals and values, prompting the MaaS industry to seek new business models. The public sector aims to achieve social benefits, emphasizing the reduction of environmental pollution and improvement of travel experiences, while private enterprises seek to maximize profits. Kamargianni et al. (2016) argue that excessive regulation may stifle the enthusiasm and innovative performance of private enterprises, while insufficient regulation could harm stakeholder interests and negatively impact project outcomes. Furthermore, some scholars have analyzed the acceptance and promotion of MaaS from the perspective of different user preferences, highlighting the influence of travel habits, pricing, and flexibility on the popularity of MaaS (Johansson, 2017; Matyas & Kamargianni, 2019; Melis et al., 2018).

Notably, MaaS has become a growing global trend and has made numerous commitments to sustainable urban transportation. On a global scale, Europe is the region where the concept of MaaS has been most extensively practiced (Butler et al., 2021). However, MaaS is increasingly attracting attention from academia and policymakers in other regions, including China, and has become a hot topic in the field of intelligent transportation. In this regard, research on MaaS among Chinese scholars remains in its early

[1] Including: Consolidated Transport Offering, Access via Digital Platform, Inter-modal Journey Planning, Bundles of Services, Payment Options, Decision-making Support, Inclusion of Extra Services, Multi-Stakeholder Cooperation.

stages, primarily consisting of introductions to the concept of MaaS and literature reviews (Chen et al., 2021; Li et al., 2018; Wang, 2018), analyses of successful practices in Europe and other developed regions (Long et al., 2019), discussions on the development methods and systems of MaaS (Liu, 2022; Liu et al., 2019; Zhang, 2022), and analyses of the challenges faced in implementing MaaS in China (Wang et al., 2022; Wang et al., 2023; Zhang et al., 2022).

Although scholars share a common focus on the analysis of the concept and theoretical evolution of MaaS, they don't fully consider the impact of environmental differences in different regions and organizational and political behavior characteristics on the implementation of MaaS. There is limited understanding of the internal dynamics of the interconnected smart transportation strategies. Specifically, this includes a discussion of key topics such as policymakers' views on Mobility as a Service (MaaS) as an innovative transportation solution, their motivations for implementing MaaS strategies, what they hope to achieve by updating smart transportation models, and specific methods for implementation.

Due to the above research gaps, this paper aims to illustrate the relationship between specific context and MaaS implementation. This paper intends to select Shanghai as a case study to explore the specific mechanisms by which internal organizational dynamics affect MaaS implementation.

3. Theoretical Framework

Given that the aim of this study is to analyze the internal dynamics of MaaS implementation, with a particular focus on how specific contexts influence practice behaviors and their performance, the theoretical framework used in this paper is based on the theory of institutional logic. This theory examines how institutions impact organizational and individual actors, shaping their actions, language, feelings, and identities, thereby influencing their rationality, perceptions, and experiences (Johansen & Waldorff, 2017). Three sets of institutional logic function as the basic way of thinking of municipalities are applied by current research (Fred, 2020; Hyndman & Lapsley, 2016; Lounsbury, 2008; Timoshenko & Khodachek, 2017), which includes traditional public administration, new public management, and new public governance.

Traditional public administration theory is based on Wilson's "political-administrative dichotomy," Weber's "bureaucracy" theory, and Taylor's scientific management theory (Dunleavy & Hood, 1994). This theoretical paradigm adheres to the principle of political-administrative separation, emphasizes a value orientation centered on efficiency, and employs hierarchical and scientific management practices. Additionally, since the ideas of Weber and Taylor are highly regarded within traditional public administration theory, this paradigm is largely value-neutral and efficient. Public administration typically focuses on administrative organizations, systems, and behaviors, while largely ignoring metaphysical issues such as administrative ethics and philosophy (Wu & Lin, 2014).

Influenced by a crisis of trust in government and market reforms, the emphasis on improving management efficiency and economic returns through market mechanisms led to the emergence of new public management theory. This logic represents a comprehensive transformation of the traditional public administration paradigm by introducing advanced business management practices into government, establishing modern economics (new institutional economics), and incorporating private sector management methods. Techniques such as target management and performance management are then applied to government management and administrative system development (Hughes, 2017). Building on the concept of limited government, new public management theory aims to emphasize attention to economy, efficiency, and effectiveness, and to facilitate interaction between government, market, and society (Osborne, 2009).

To address the issue that neither government nor market alone can effectively govern public affairs, new public governance theory has emerged. This theory recognizes the importance of social forces represented by civil society and non-profit organizations in the governance of public affairs, emphasizing the diversification of governance actors and the development of new pathways for governance through negotiation (Christensen, 2012).

In summary, these three institutional logics can be used to analyze the specific ways in which the Shanghai municipal government implements MaaS projects. That is, since institutional logics are fundamental principles upon which all governmental activities are based, we can analyze the institutional logics held by MaaS operators in Shanghai through the analysis of discourse expressions, value propositions, and goal setting. And then find out the specific way of implementing MaaS in Shanghai based on these logical characteristics. In order to illustrate the basic content of the above three institutional logic more intuitively and the relationship between these logic and the implementation of MaaS in Shanghai, we have made the following reflection **Table 1**and **Table 2**.

Table 1 Key ideas of different institutional logic in the implementation of MaaS

Elements	**Traditional Public Administration**	**New Public Management**	**New Public Governance**
Governance philosophy	The government is the planner and implementer of MaaS based on principles of bureaucracy and rule of law, hierarchical organizational structure where all documents, norms and standards create legitimacy between government levels	More emphasis on the allocation role of the market to MaaS, more about managerial aspects and business orientation in services, decentralized organizational structure with focus PPS and legitimacy by means of performance and profits generation	The government is part of the multi-subject of the MaaS project and open to involve all stakeholders into decision-making, cooperative organizational structure with involving citizens and creating legitimacy to all stakeholders
Role of government	Key role in controlling MaaS development and its direction	Less role, more steering the direction of MaaS and outsourcing it for business development	Distributed role opening dialogue with stakeholder on MaaS development
Public participation and role of citizen	No explicit public engagement MaaS, citizen is ruled	Participate selectively in MaaS as a consumer, citizen as consumer	Actively engage with MaaS, citizen is a stakeholder and decision-maker
Emphasis and values in MaaS development	Provide institutional guarantee for traffic travel and traffic facilities with a focus on formal procedures for MaaS policy implementation	Marketization or privatization to reduce unnecessary government intervention in the field of travel for traffic efficiency and profitability for business	Provide public travel services and contribute to society and diverse demands of different groups, including citizens
Assessment of MaaS development	Formal assessment based on bureaucratic rules and budgets/inputs	Evaluation of economic benefits and output of MaaS	Multiple dimensions of evaluation of MaaS for different stakeholders, including citizens.

Source: Made by authors

Table 2 Keywords/Codes of different institutional logic in the implementation of MaaS

	Traditional Public Administration	**New Public Management**	**New Public Governance**
Keywords/Codes	Government-led Resident Rules/Specifications/Policies/Laws Obey Admin/Leader executor / executor Departments at all levels Objectivity	Management/Supervision Efficiency Results (output/result) Satisfaction Customer/user/consumer Strategic Planning Measures/Indicators/Targets Objective Resource/value Contract	Governance Transparency External responsibility Stakeholders Mesh Cooperate Diverse Sustainable

	System guarantee Procedure Concentrated Function	Quality/suitability Cost Performance Audit Flexibility Decentralization Responsible/duty Public Affairs Market Corporation/Agency Competition/Tendering/Privatization Economic benefits	Ethics Fair public participation Democracy Negotiation Civil Society/Non-Profit/Third Party Sector Accountability Public Service Travel needs Public Interest Social benefits

Source: Made by authors

4. Research Design

4.1 Research strategy—Shanghai as a case study

There are obvious differences between Europe and China. Specifically, the practice of mobility as a service in Europe is characterized by diversification and decentralization. In China, however, the development of the concept of Mobility as a Service is mainly guided by the national macro-policy, and it is an important measure of the government's reform in the transportation field (Chen et al., 2021). Thus, we can say the MaaS implementation in Europe is more sourced while it is more holistic in China.

The development of mobility in Shanghai is consistent with China's economic development process. Moreover, MaaS is currently a hot topic in the field of smart mobility in Shanghai. After entering the 21st century, the Shanghai Municipal Government has carried out a series of reforms in the field of mobility, and has successively launched the urban public transport card service, the comprehensive transport information platform, and the comprehensive transport information data platform with sharing and exchange functions. On October 10, 2022, the Shanghai MaaS platform "Suishenxing" App was launched. This application integrates public transport tools, as well as mobility services such as one-touch call cars and smart city parking. The launch of the "Suishenxing" app marks that the Shanghai MaaS system officially provides services to the public. The Shanghai Municipal Government believes that the "Suishenxing" APP is a mega-city MaaS platform led by the government and specially responsible for construction and operation. It not only reflects the public welfare of the government to serve the public, undertakes the operation of public transport data in Shanghai, but also actively participates in market competition (Xinhua News, 2022).

Obviously, the Shanghai Municipal Government and society currently pay high attention to MaaS, and a relatively complete public information can be found in the government website. Therefore, Shanghai as a MaaS case is an excellent choice.

4.2 Data collection

In this process, our main data collection methods are the documents analysis method. Creswell and Creswell (2018) believe that the investigator may need to collect qualitative documents during the course of the study. These can be public documents (e. g., newspapers, meeting minutes, official reports) or private documents (such as personal diaries and diaries, letters, emails). For our research question, the documents we need to collect are government documents related to MaaS. In terms of government documents, the data we choose to collect are mainly on government work reports, guidance and materials from official news media. The main sources of these data are government websites, including: the State Council website (http://www.gov.cn/), Ministry of Transport website (https://www.mot.gov.cn/), Shanghai Municipal Transportation Commission website (https://jtw.sh.gov.cn/), Shanghai Municipal

Government website (https://www.shanghai.gov.cn). Specifically, the documents is shown in Appendix 1.

Since there is not much content about MaaS in China before 2019, we compiled the main documents and media reports related to MaaS from the State Council, the Ministry of Transport, the Shanghai Municipal Government, and the Shanghai Municipal Transportation Commission from March 2019 to 2024. Below, we will discuss in detail the internal governance logic that Shanghai received during the implementation of MaaS during this period.

4.3 Data analysis

In the process of data analysis, this study first sorted out the collected government announcements, regulations and policies, news media reports. In the second step, this study analyzed documents according to the core propositions and keywords of the three logic summarized in the theoretical framework section, including qualitative analysis of documents in relation to specific positions from **Table 1** (TPA, NPM or NPG) along with counting key words and frequencies in the documents based on **Table 2** We will make some tables to make the statistical results more clear and visualized. Therefore, we will use the three logic to systematically analyze what kind of logic dominates in the process of implementing MaaS in the context of Shanghai, or the combination of multiple logic. It is worth noting that we are not limited to these three logic. We should not ignore the unusual influence that the specific context of China and its government tradition may have on institutional logic (Timoshenko & Khodachek, 2017) and its influence on the implementation of MaaS.

4.4 Quality of research

4.4.1 Reliability

In this study, the use of case analysis method has a certain degree of subjectivity, because this research method is usually influenced by the researcher's personal experience and view of values. At the same time, the data used by the research mainly comes from official documents issued by the Shanghai Municipal Government. Other authoritative and public documents are also collected for cross-comparison to verify the reliability and consistency of our research. The reliability of this thesis comes from three aspects. Firstly, we have collected information from publicly available content on government websites and there are no barriers to their accessibility. Secondly, we have used a transparent research approach, and in the following sections we show the entire process of collecting, processing and analyzing the data and provide the necessary references. Finally, the thesis is co-authored by two authors who have carefully reviewed and cross-referenced the full text to reduce human error.

4.4.2 Validity

The main research content of this study is to study the implementation of MaaS in Shanghai, so it is more to explore the explanatory analysis of this research object, rather than to propose a new research framework with replicability. Therefore, this study mainly focuses on how to solve the problem of internal validity. In order to solve this problem, we ensure the consistency of our research theories, research questions, research methods and research results by reading literature and consulting experts in related fields including supervisors.

5. Empirical Findings

5.1 Statistical results of word frequency

In this section, the influence of three different institutional logics on the Shanghai municipal government's implementation of MaaS will be analyzed in detail. First, the quantitative function of Nvivo software will be utilized to demonstrate the internal dynamics of the Shanghai municipal government's implementation of MaaS (see Appendix 2). It presents the distribution of keywords related to institutional logics found in

the collected documents. Subsequently, a literature analysis will be conducted based on the key elements discussed in the framework section (see Appendix 3). The following are the main findings in this regard.

According to the analysis, keywords representing New Public Management (NPM) logic appeared most frequently (879 times) in documents related to MaaS implementation in Shanghai. In contrast, keywords associated with New Public Governance (NPG) logic and Traditional Public Administration (TPA) logic occurred less often (816 times and 356 times, respectively). Among all documents, the Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the Shanghai Municipal Government contained the highest number of occurrences of the three institutional logics, with keywords reflecting traditional administrative management appearing 100 times, accounting for 0.57% of the total text. Keywords reflecting new public management appeared 203 times (1.15%), while those reflecting new public governance were mentioned 148 times (0.95%). In other documents, the influence of TPA, NPM, and NPG logics on the Shanghai municipal government's implementation of MaaS can also be observed. TPA-related keywords appeared 51 times and 41 times in the White Paper for the Development of Shanghai Municipal Transportation (2022 Edition) and the Implementation Opinions of Digital Transformation in the Transportation Industry of Shanghai Municipality (2021-2023) respectively. NPM-related keywords appeared 108 times in the Action Plan for Carbon Dioxide Peaking in Transportation Section of Shanghai Municipality and the Implementation Operations of Digital Transformation in the Transportation Industry of Shanghai Municipality (2021-2023). Keywords related to NPG logic were found 110 times and 104 times in the Implementation Plan for Carbon Dioxide Peaking of Shanghai Municipal Government and the White Paper for the Development of Shanghai Municipal Transportation (2022 Edition), respectively.

Furthermore, within all documents related to MaaS by the Shanghai municipal government, these three institutional logics manifested through a series of specific keywords. The most frequently occurring keywords under the TPA logic were "function," "policy," and "role" (appearing 117, 87, and 46 times, respectively). For NPM logic, the most frequent keywords were "management," "market," and "collaboration" (with occurrences of 257, 125, and 102 times, respectively). In the NPG logic, the most frequently appearing keywords were "sustainability," "governance," and "sharing", (appearing 191, 156, and 69 times, respectively).

5.2 Results based on textual evidence

This study divides the behavior of government governance into five key ideas（see Chapter 4）, and combine it with the specific administrative structure and transportation industry environment in China to discuss the specific manifestations of these three institutional logic in the specific context of Shanghai. Based on the empirical results in Chapter 5 and the specific evidence in the data, **Table 3** shows the key ideas and institutional logic of the implementation of MaaS in Shanghai.

Table 3 Research results of institutional logic

Elements	Keywords	Main observations from documents	Dominating logic / combination of logic
Governance philosophy	government-led, participation from the market and stakeholders	· Giving legitimacy to MaaS-related systems and policies through bureaucracy · More emphasis on the allocation role of the market to MaaS · Set up cooperative organizational structure to govern the MaaS	A combination of TPA logic, NPM logic and NPG logic
Role of government	controller	·Government as the main role to steer the direction of MaaS development	TPA logic
Public participation and role of citizen	as consumers and potential co-creators	· The public can participate selectively in MaaS as a consumer · The public are encouraged to actively and autonomously engage in the implementation of MaaS · Citizens are regarded as the consumer of MaaS	A combination of NPM logic and NPG logic
Emphasis and values in MaaS development	Social and economic performance	·Marketization or privatization to reduce unnecessary government intervention in the field of travel ·Driven by the market, responsible for the travel needs of customers ·Focus on MaaS-improved traffic efficiency and economic benefits · Provide public travel services and contribute to society · Based on the needs of public travel, the public can enjoy the results of MaaS ·Diverse, focusing on different public responsibilities	A combination of NPM logic and NPG logic
Assessment of MaaS development	formal but diversifying	· Formal assessment based on MaaS rules ·Evaluation of actual economic and social benefits based on MaaS ·Evaluate MaaS in terms of governance, transparency, sustainability, availability, etc.	A combination of TPA logic, NPM logic and NPG logic

Source: Made by authors

6. Analysis and Discussion

6.1 TPA Logic: A traditional governance practice for the MaaS Implementation in Shanghai

The influence of Traditional Public Administration Logic is evident in the implementation of the MaaS strategy by the Shanghai Municipal Government, specifically in the areas of Governance Philosophy, Role of Government and Assessment of MaaS Development.

Firstly, in terms of Governance Philosophy, a mixture of three logic is reflected. Whereas TPA Logic functions primarily by providing legitimacy. The Shanghai Municipal Government continues to follow the most traditional approach, i.e. the bureaucratic and rule of law principles, relying on the issuance of administrative orders and the development of formal plans by government to establish the specific practices and objectives of MaaS implementation. All documents related to the implementation of MaaS in the specific context of Shanghai are issued by the Shanghai Municipal Government and its subordinate departments, and these documents show a clear hierarchical character. As the planner and implementer of the MaaS, the Shanghai Municipal Government has clarified its role as the dominant player by issuing norms and administrative arrangements, and relies on the existing governmental structure to gain the corresponding legitimacy.

Secondly, in terms of Role of Government, we find that TPA Logic is the dominant logic. Specifically, the Shanghai Municipal Government is the actor that controls the process and direction of MaaS implementation. This is because all documents regarding the promotion of MaaS in Shanghai are issued by the Shanghai Municipal Government and its subordinate Shanghai Municipal Transportation Commission. Words such as “government bottom-line constraints and development guidance” and “strategic leadership” show the government’s leadership position in MaaS implementation. The reference to market mechanisms suggests that the Shanghai Municipal Government is using market mechanisms as a complementary and optimal solution to bureaucratic mechanisms, while controlling the MaaS project. The Shanghai Municipal Government believes that the allocation of resources through the market is the best way to make the MaaS work, so that MaaS implementation is in line with the government’s plans and objectives in the transport sector. Therefore, the Shanghai Municipal Government,as a local administrative body, believes that it should play the role of ‘steerer’ in the implementation of MaaS and ensure the development of MaaS is on the right track.

Finally, the important role of TPA logic is also reflected in the current Assessment of MaaS Development. The Shanghai Municipal Government has used the formal evaluation mechanisms and standards in place as an important tool to assess the effectiveness of MaaS implementation. In a number of documents, the Shanghai Municipal Government has referred to the importance of government-established evaluation systems and binding indicators to monitor the MaaS strategy, and has sought to establish annual and process evaluations to ensure that the MaaS development can be supervised by different levels of authorities and to intervene administratively where necessary.

6.2 NPM Logic: A comprehensive guidance for the MaaS implementation in Shanghai

In the Shanghai Municipal Government’s implementation of MaaS, the New Public Management Logic has a comprehensive and important influence. It is reflected in four areas: Governance Philosophy, Public Participation and Role of Citizen, Emphasis and values in MaaS development, Assessment of MaaS Development. The coexistence of different logic is reflected in each of these elements, but it is undeniable that the NPM Logic is an important guide in some of the key issues of MaaS development.

Firstly, the NPM Logic is reflected in the Governance Philosophy, which mainly emphasises market participation. The role of the market's allocative role in implementing MaaS and improving the efficiency of travel services is frequently mentioned in documents related to MaaS by the Shanghai Municipal Government. This suggests that the Shanghai Municipal Government holds the opinion that there is a certain complementary relationship between the government and the market in terms of how MaaS governance is implemented. To be specific, it has shown that there is a principle of "government leads, market participates" in the process of MaaS implementation in Shanghai. Keywords such as "management", "efficiency", "consumer", "planning", "market" are the most frequently used words in the documents issued by the Shanghai Municipal Government in relation to the MaaS implementation. This indicates that the Shanghai Municipal Government has made the role of the market an important principle in promoting the development of MaaS locally, which is in line with the fundamental approach of political reform and market-based economic development that China has maintained in recent decades.

Secondly, the emphasis on the market economy and mechanisms has also led the Shanghai Municipal Government to take a more open attitude towards both Public Participation and Role of Citizen, Emphasis and values in MaaS development. On the one hand, because the Shanghai Municipal Government is influenced by NPM logic in the implementation of the MaaS, there is a clear market dimension to the definition of the role of public participation and citizens. Since citizens are seen as consumers with a clear need for more smart and convenient mobility solution, they can participate in by putting forward their needs. The Shanghai Municipal Government also encourages this proactive approach, thus providing the impetus for its market-based operation. On the other hand, the Shanghai Municipal Government also believes that it is important to reduce unnecessary interventions in the implementation of transport and mobility reforms, based on the logic that the market plays a leading role, so as to allow the market mechanism to work better. The government, in turn, needs to adapt its strategy according to the travel needs of the public and mobilizes the market as a whole in the implementation of MaaS.

Finally, influenced by the new institutional economics, the Shanghai Municipal Government also tends to adopt some elements of NPM theory in its Assessment of MaaS development. For example, the Shanghai Municipal Government has documented that actual economic and social benefits are important indicators for evaluating the development situation of MaaS, and that Mobility as a Service is being used by the Shanghai Municipal Government as an innovative solution in the transport sector to meet the practical needs of citizens. As such, the Shanghai Municipal Government has proposed to focus on the role of MaaS in improving transport efficiency and creating social benefits.

6.3 NPG Logic: A promising means for the MaaS implementation in Shanghai

In the Shanghai Municipal Government's implementation of MaaS, the influence of the New Public Governance Logic is also reflected in four areas: Governance Philosophy, Public Participation and Role of Citizen, Emphasis and values in MaaS development, Assessment of MaaS Development.

Although the Shanghai Municipal Government has consistently adopted an NPM Logic compliant approach when implementing MaaS, this logic has also plays the greatest role in the specific environment in Shanghai. However, through empirical findings, we found that the Shanghai Municipal Government has also reflected many NPG Logic related content in the process of developing MaaS, or that this administrative paradigm is an promising auxiliary means.

Specifically, the Shanghai Municipal Government has made pluralistic participation mechanisms and valuing the interests of all stakeholders an important part of its future Governance Philosophy. In terms of how MaaS will be conducted, the Shanghai Municipal Government has proposed the future development direction of establishing a collaborative organizational structure. In the documents released,

the Shanghai Municipal Government has repeatedly mentioned the problem of "insufficient market and social mechanisms" in the current MaaS implementation process. Therefore, in the future, there is a need to strengthen the cooperation between the government and enterprises and other organizations in the community in terms of business collaboration and data exchange.

The emphasis on the participation of the whole society and the realization of broader social interests has also prompted the Shanghai Municipal Government to hold more advanced concepts in terms of public participation and the Emphasis and Values in MaaS development. It is precisely because the Shanghai Municipal Government is influenced by the New Public Governance thinking in the planning, formulation, and implementation of the MaaS. The Shanghai Municipal Government considers the purpose of implementing MaaS from multiple perspectives. In the document, the Shanghai Municipal Government mentioned that promoting the construction of the MaaS platform can achieve multiple goals, including meeting the needs of citizens, solving transportation problems, assuming public responsibility, and promoting market-oriented reform. This indicates that the Shanghai Municipal Government has realized the necessity of assuming diverse responsibilities and contributing to the different needs of society and different groups, including citizens, in the process of formulating and implementing MaaS.

Therefore, in the aspect of Public participation and role of citizen, in addition to participating as consumers, the Shanghai Municipal Government is also gradually improving the digital platform for direct participation of citizens. Although it also acknowledges that a multi-party governance system has not yet been truly formed, it also stated in the document that the implementation of MaaS will promote the formation of a "multi governance" pattern.

Finally, influenced by social change and economic development, the Shanghai Municipal Government has tended to adopt some elements of NPG theory in its Assessment of MaaS development. For example, the Shanghai Municipal Government has introduced new evaluation tools such as 'citizen experience evaluation' as a complement to formal evaluation mechanisms and market-based evaluation based on economic benefits. The Shanghai Municipal Government has documented the need to accelerate the establishment of transparent, open and sustainable MaaS governance mechanisms so that the development of the strategy can be monitored by society as a whole and the necessary information can be made available to stakeholders, including citizens.This has led the Shanghai government to make the realization of the public and social interests as a long-term orientation of MaaS implementation. The relevant documents released by the Shanghai Municipal Government reflect the importance attached to public needs and are committed to enabling all citizens, including the elderly and disabled, to enjoy the convenience brought by MaaS. This indicates that the Shanghai Municipal Government is increasingly using the value proposition of "people-oriented" as one of its fundamental guiding principles for governance.

However, it is important to note that the NPG statements are mainly "planning" documents, which express a better vision of the future than those of NPM and TPA Logic, which have become realistic measures for the government to implement MaaS. It remains to be seen whether these NPG logical designs can be put into practice. What is undeniable is that the municipal government of Shanghai has already made the transition to NPG logic.

6.4 Special contents of institutional logic in the context of China

This study use the lens of institutional logic to examine how MaaS has been implemented by the government in the particular context of Shanghai. It is shown that the mixture of different governance logic used by the Shanghai Municipal Government in the MaaS implementation process is not only a reflection of common international practice, but also a result of the Chinese political tradition.

On the basis of the empirical analysis, we can say that the dynamic changes in the governance logic of the Shanghai Municipal Government during the implementation of MaaS can be seen as a microcosm of the specificity of governance logic in China. In short, similar to many developing countries and even some developed countries, the governance reform of Chinese government institutions has not completed the fundamental transformation from the old public administration to the new public management and post-new public management models. Reform in the Chinese government is an ongoing, dynamic learning process of layering, in which new reforms complement rather than replace old structures and cultures (Christensen, 2020). We believe that the reasons for this phenomenon can be explained in two ways.

Firstly, as a country with a long history and a unique culture, China's administration reflects an inheritance of traditional heritage. This so-called inheritance is an ideological and cultural tradition that has been developed by the Chinese people over thousands of years and which is mainly concerned with the view of the relationship between the state and society in the Chinese context.

The traditional Chinese ethical culture and philosophy saw the social nature of human beings as the result of natural evolution, leading to the emergence of the "home-country isomorphism" model of governance. Specifically, this institution considers the clan as an extension of the family and the state as an extension and enlargement of the family. The head of clan is the natural leader of the family, and the ruler or authority of the state is seen as enjoying supreme power as a matter of course. This mode of governance is both a social structure and a cultural formation. It emphasizes the similarities in the organizational structure of individuals, groups and the state, and advocates interaction based on blood and kinship ties. This has led to the Chinese civilization being characterized by the unity of the state and society, and the unity of the individual and the collective. In turn, the authorities, represented by the government, not only used law to maintain their rule, but also supplemented it with moral indoctrination to enhance the legitimacy of their rule. This patriarchal style of administration has created a sense of identity and trust in the government.

Traditionally, the people believed that the government, as the administrative organ of the state, had superior judgement and wisdom to make decisions in the interests of the individual and the common good. Thus, the Shanghai Municipal Government, as the authority, did not face any resistance from the public in the MaaS implementation. By issuing a document informing the whole community of the new policy in the field of transport and mobility, the municipal government played the role of parents and provided a solution to the mobility needs of the population.

Secondly, with the development of the age and social transformation, China has also shown some peculiarities in its political system and administrative reforms. Since the Chinese government implemented the policy of Reform and Opening up, China has achieved in forty years what Western countries have achieved in 100 years. This has made it more challenging for China to face social and economic issues and to promote the implementation of related policies (Guo, 2021).

Moreover, influenced by politics, economics and culture, China does not have an administrative-political dichotomy in its administrative practices, and it focuses more on result than process. As such, the Shanghai Municipal Government has referred to the importance of MaaS implementation for urban development, government transformation and solving transport mobility problems rather than values. The Shanghai Municipal Government has adopted an approach derived from different institutional logic in relation to different aspects of MaaS implementation, and this policy choice is based on practical needs rather than on adherence to certain values.

The 'path dependence' in administrative thoughts, which is a result of historical memory and cultural traditions, and the realities of China's modern political and economic reforms have led to a distinctly

Chinese character in the process of institutional reform and governance practice. Thus, we can say that the institutional logic from the West has been adapted to the political institutions and cultural characteristics of China, forming a special system with a complex and cascading nature. This combination of governance includes elements of traditional public administration, new public management and new public governance, as well as some unique elements from China's historical development and traditional culture.

7. Conclusion

This study presents the results of a documentary analysis of the implementation of Mobility as a Service (MaaS) in Shanghai city government. Using the theory of institutional logic (Thornton et al., 2012), It provides an empirical explanation that how the Shanghai city government implements MaaS.

The analysis of internal dynamics in the implementation of MaaS has shown that the Shanghai municipal government has achieved different goals in the implementation of MaaS by combining Traditional Public Administration Logic, New Public Management Logic and New Public Governance Logic. While emphasizing the decisive role of the market in the operation of MaaS, the Shanghai municipal government also retains a strong bureaucracy in terms of legitimacy and policy making. In addition, the Shanghai municipal government is actively undertaking diversified social responsibilities, also improving the mechanism of enterprise cooperation and citizen participation. This shows that China's special political tradition and institutional arrangements make the Shanghai municipal government also influenced by the traditional governance logic while promoting its own reform. In the internal dynamics of the implementation of MaaS, the new public management logic plays a leading role, and the increasing influence of the new public governance logic and the coexistence of the continuation of the three governance logic.

This study leads us to reflect on the fact that policy implementation is indeed not 'one-size-fits-all' (Butler et al., 2021). As highlighted by previous studies, government departments are the supervisors and promoters of MaaS and play a central role in its implementation (Kamargianni et al., 2016; Zhang, 2019). On the other hand, MaaS implementation does exemplify the importance of public-private partnerships (Matyas & Kamargianni, 2019; Wang et al., 2021; Wang & Wang, 2019). Our research provides further explanations for the government-market relationship in the particular context of China, and for the cooperation between the government and other stakeholders, including citizens.

The study also provides an interpretive approach to understanding how China's political and social characteristics will influence the practical implementation and development of innovation in transport and other areas. The findings of the research will contributes to the MaaS-related research in several ways. It provides an explanatory framework to address the issue of the absence of universal solutions in the implementation of MaaS (Butler et al., 2021). It analyzes how China's political and social characteristics impact the practical effects of innovation in the transportation sector. In addition, the paper analyzes the influence of specific contexts on MaaS implementation. The Shanghai municipal government positions MaaS as a new approach to urban transportation and environmental governance. By offering a new perspective on how the government, as a primary actor, takes concrete steps to implement MaaS, it fills gaps in prior research and provides a novel link between MaaS implementation and sustainable urban development.

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Appendices

Appendix 1: Documents of MaaS Implementation in Shanghai

	Number	Document/Newspaper	Sources
the State Council	1	Action Plan for Carbon Dioxide Peaking Before 2030	http://www.gov.cn/zhengce/zhengceku/2021-10/26/content_5644984.htm
	2	The Program of Building National Strength in Transportation	www.gov.cn.http://www.gov.cn/gongbao/content/2019/content_5437132.htm
	3	Guidance of the CPC Central Committee and the State Council for Carbon Dioxide Peaking and Carbon Neutrality in Complete,Accurate and Full Implementation of the New Development Philosophy	www.gov.cn.http://www.gov.cn/gongbao/content/2021/content_5649728.htm
	4	Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the People's Republic of China	http://www.gov.cn/xinwen/2021-03/13/content_5592681.htm
Ministry of Transport	5	Key Tasks for the Shanghai's Pilot Project of Building National Strength in Transportation from the Ministry of Transport	https://xxgk.mot.gov.cn/2020/jigou/zhghs/202011/t20201130_3497007.html
	6	Guiding Opinions of the Ministry of Transport on Promoting the Construction of New Infrastructure in the Field of Transportation	http://www.gov.cn/zhengce/zhengceku/2020-08/06/content_5532842.htm
	7	The 14th Five-Year Plan for the Development of Digital Transportation	https://xxgk.mot.gov.cn/2020/jigou/zhghs/202112/t20211222_3632469.html
	8	The 14th Five-Year Plan for the Development of Green Transportation	https://xxgk.mot.gov.cn/2020/jigou/zhghs/202201/t20220121_3637584.html
Shanghai Municipal	9	Implementation Plan for Carbon Dioxide Peaking of Shanghai Municipal Government	https://www.ndrc.gov.cn/fggz/hjyzy/tdftzh/202208/t20220808_1332758.html

Government	10	The 14th Five-Year Plan for the Development of Comprehensive Transportation of Shanghai Municipal Government	https://www.shanghai.gov.cn/nw12344/20210721/ca22dbbbafb64f719f8b9350e151d879.html
	11	The 14th Five-Year Plan for the Comprehensive Promotion of Urban Digital Transformation of Shanghai Municipal Government	www.shanghai.gov.cn.https://www.shanghai.gov.cn/nw12344/20211027/6517c7fd7b804553a37c1165f0ff6ee4.html
	12	Guidance of the Shanghai Municipal Government on the Comprehensive Promotion of Urban Digital Transformation	http://www.cac.gov.cn/2021-01/08/c_1611676479346954.htm
	13	The White Paper for the Development of Shanghai Municipal Transportation (2022 Edition)	https://www.shanghai.gov.cn/nw12344/20221014/cfcb6a655dab468e9bb27a6e3960e36a.html
	14	Several Policies and Measures of Shanghai Municipal Government for Promoting the Urban Digital Transformation	http://service.shanghai.gov.cn/XingZhengWenDangKuJyh/XZGFDetails.aspx?docid=REPORT_NDOC_007913
	15	Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the Shanghai Municipal Government	https://www.shanghai.gov.cn/nw12344/20210129/ced9958c16294feab926754394d9db91.html
Shanghai Municipal Transportation Commission	16	The Three-Year Action Plan (2020-2022) for the Promotion of New Infrastructure Construction in the Transportation Industry of Shanghai Municipality	https://jtw.sh.gov.cn/zxzfxx/20210114/53c4a451732343bf897a7edf02cc5299.html
	17	The Action Plan for Carbon Dioxide Peaking in Transportation Sector of Shanghai Municipality	https://jtw.sh.gov.cn/zxzfxx/20230206/c611f44e6ee247739088c15679ba35e3.html
	18	The 14th Five-Year Plan for the Development of Green Transportation of Shanghai Municipality	https://jtw.sh.gov.cn/zxzfxx/20230206/d1d7a90fb65745db82ae94bba4a8cb6c.html
	19	The Implementation Opinions of Digital Transformation in the Transportation Industry of Shanghai Municipality (2021-2023)	https://jtw.sh.gov.cn/zxzfxx/20210426/04d62d5bf3e84a23ad98b7bc56e44893.html
Newspaper form Shanghai	20	Shanghai MaaS system launched and many places explored integrated travel services	http://www.news.cn/tech/2022-10/10/c_1129059297.htm
	21	State-owned enterprises in Shanghai promote the construction of MaaS	https://www.gzw.sh.gov.cn/shgzw_zxzx_gqdt/202210

Municipal Transportation Commission		“mobility as a service” system	12/b5fc1d9fd85e4a87b26c0401912e0721.html
	22	“Suishenxing” APP is here! You can take the bus, call a taxi, and find a parking space, and travel freely in Shanghai with “one QR-code”	https://sghexport.shobserver.com/html/baijiahao/2022/10/12/877860.html
	23	Jointly build the MaaS ecosystem with a one-stop green travel experience	https://www.zgjtb.com/2022-11/16/content_332246.html

Sources: the State Council, Ministry of Transport, Shanghai Municipal Government, Shanghai Municipal Transportation Commission.

Appendix2: The distribution of keywords in three institutional logic in different literature

Document	TPA		NPM		NPG	
	Ref. Point	Occurrence	Ref. Point	Occurrence	Ref. Point	Occurrence
Implementation Plan for Carbon Dioxide Peaking of Shanghai Municipal Government	25	0.36%	81	1.18%	104	1.91%
Outline of the 14th Five-Year Plan (2021-2025) for National Economic and Social Development and Vision 2035 of the Shanghai Municipal Government	100	0.57%	203	1.15%	148	0.95%
Several Policies and Measures of Shanghai Municipal Government for Promoting the Urban Digital Transformation	35	0.53%	68	1.03%	31	0.46%
The 14th Five-Year Plan for the Development of Green Transportation of Shanghai Municipality	10	0.55%	32	1.77%	81	4.30%
The Action Plan for Carbon Dioxide Peaking in Transportation Sector of Shanghai Municipality	24	0.20%	108	0.91%	74	0.67%
The Implementation Opinions of Digital Transformation in the Transportation Industry of Shanghai Municipality (2021-2023)	41	0.51%	108	1.40%	87	1.18%

The Three-Year Action Plan (2020-2022) for the Promotion of New Infrastructure Construction in the Transportation Industry of Shanghai Municipality	10	0.24%	39	0.94%	32	0.79%
The White Paper for the Development of Shanghai Municipal Transportation (2022 Edition)	51	0.35%	102	0.72%	110	0.84%
Guidance of the Shanghai Municipal Government on the Comprehensive Promotion of Urban Digital Transformation	31	0.50%	53	0.80%	60	1.09%
The 14th Five-Year Plan for the Comprehensive Promotion of Urban Digital Transformation of Shanghai Municipal Government	14	0.35%	33	0.86%	38	1.11%
The 14th Five-Year Plan for the Development of Comprehensive Transportation of Shanghai Municipal Government	15	0.24%	52	0.87%	51	0.95%
IN TOTAL	**356**		**879**		**816**	

Sources: Made by authors.

Appendix 3. Evidence of Institution Logic

Elements	Evidence	Document
Governance philosophy	Strengthen legislation in comprehensive new fields such as smart transportation, focusing on the integration of laws, regulations, and normative documents.	The White Paper for the Development of Shanghai Municipal Transportation (2022 Edition) (Chapter 14, Section 3)
	Enhance the top-level design of standards and normative systems in the transportation industry, forming an advanced, forward-looking, and applicable standards and guidelines system. Support and guide the construction of new infrastructure in the industry.	The Three-Year Action Plan (2020-2022) for the Promotion of New Infrastructure Construction in the Transportation Industry of Shanghai Municipality (Chapter 4, Section 3).
	The implementation of MaaS will "strengthen business collaboration and data linkage among various information systems, including government, enterprises, and society"	The 14th Five-Year Plan for the Development of Green Transportation of Shanghai Municipality
	Suishenxing and the Shanghai Data Exchange will "jointly explore the authorized operation of public data in the transportation sector, promoting the listing and trading of data products."	Jointly build the MaaS ecosystem with a one-stop green travel experience (CTN News, 2022)
	Shanghai government has reached cooperation agreements with private enterprises involved in various transportation modes, such as ride-hailing and bike-sharing, "aimed at optimizing the travel experience for citizens through market competition and cooperation."	Shanghai's MaaS System Launches Multi-Location Exploration of Smart Mobility Services (Xinhua News Agency, 2022)
Role of government	Strengthen the government's bottom-line constraints and developmental guidance for the MaaS strategy.	The Three-Year Action Plan (2020-2022) for the Promotion of New Infrastructure Construction in the Transportation Industry of Shanghai Municipality (Chapter 2, Section 4)
	Adhere to strategic leadership… implement the central strategic deployment and strengthen support for national strategies.	The 14th Five-Year Plan for the Development of Comprehensive Transportation of Shanghai Municipal Government (Chapter 3, Section 4)
	Suishenxing as a key operational entity within Shanghai's MaaS framework, is composed	Building a mobility-as-a-service system, Shanghai's

	of six state-owned enterprises, including SAIC Group, Jiushi Group, Shentong Metro, INESA, Shanghai Construction Investment, and Shanghai CITIC.	green mobility integrated platform “Suishenxing” is launched (Wenhui News, 2022)
Public participation and role of citizen	Develop application scenarios involving “citizen experience evaluation” and explore the assessment of user experience systems.	Guidance of the Shanghai Municipal Government on the Comprehensive Promotion of Urban Digital Transformation (Chapter 5, Section 5)
	The role of citizens is described in terms such as “diverse participation mechanisms,” “citizen involvement in public policy formulation and social governance,” and “broad public participation.”	The 14th Five-Year Plan for the Development of Comprehensive Transportation of Shanghai Municipal Government (Chapter 4, Section 3)
	Shanghai municipal government aims to “meet user travel needs” through the introduction of “Suishenxing”.	Shanghai MaaS system launched and many places explored integrated travel services (Xinhua News Agency, 2022)
Emphasis and values in MaaS development	Better meet the demands for improved living standards and quality of life, the government aims to adapt the evolving transportation service requirements of an innovative and aging society, and create a high-quality transportation system that satisfies the public	The White Paper for the Development of Shanghai Municipal Transportation (2022 Edition) (Chapter 5, Section 24).
	The implementation of MaaS is intended to enhance travel efficiency for citizens by “building a new ecosystem and framework for digital transportation centered around the efficient and convenient travel needs of citizens, promoting MaaS, and using data to connect travel demands with service resources”	The 14th Five-Year Plan for the Comprehensive Promotion of Urban Digital Transformation of Shanghai Municipal Government (Chapter 4, Section 4 & 8)
	MaaS should “optimize digital accessibility, addressing imbalances in digital application capabilities due to generational, income, educational, and regional differences”	
	“Suishenxing” covers over 1,560 bus routes and 17 ferry routes, facilitating access to all urban rail transit lines. Taxi services are integrated through the unified platform “Shencheng Travel,” which consolidates information from over 50,000 drivers.	The Implementation Opinions of Digital Transformation in the Transportation Industry of Shanghai Municipality (2021-2023) (Chapter 5,Section 2)
	Comprehensively deepen reforms in administrative management, strengthen the rule of	Outline of the 14th Five-Year Plan for National

	law… continue to eliminate unnecessary administrative measures… and implement differentiated approval authority.	Economic and Social Development and Vision 2035 of the Shanghai Municipal Government (Chapter 16, Section 5).
	MaaS can help reduce barriers for citizens when switching between transportation modes, making payments, and using services, while also addressing challenges such as urban transport capacity shortages, traffic congestion, and limited parking availability	Shanghai's MaaS System Launches Multi-Location Exploration of Smart Mobility Services (Xinhua News Agency, 2022)
	The "Suishenxing" app collaborates with "Shencheng Travel" and the Shanghai IPTV business platform "Baisitong" to offer "smart travel via television." This allows elderly users to call for taxis using a TV remote and view driver order statuses and estimated arrival times on a large screen.	Jointly build the MaaS ecosystem with a one-stop green travel experience (CTN News, 2022)
Assessment of MaaS development	Implementing strict regulatory assessments… fully leverage existing energy conservation and emission reduction mechanisms in the transportation sector. Strengthen indicator constraints, conduct annual assessments, and establish an assessment mechanism to promptly monitor work progress	The Action Plan for Carbon Dioxide Peaking in the Transportation Sector of Shanghai Municipality (Chapter 4, Section 3)
	Using non-formal evaluation mechanisms such as citizen experience assessments and user experience systems to evaluate the performance of MaaS	The 14th Five-Year Plan for Comprehensive Promotion of Urban Digital Transformation (Chapter 7, Section 3)

Source: Made by authors