



PMS development in local public transport: Comparing Milan and Amsterdam



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ABSTRACT

This study focuses on the process of Performance Measurement System (PMS) development in the local public transportation sector. This development refers to the trajectory from design to redesign and from the initial use of the PMS to new ways of use. The design, use and development of PMS have been investigated for two different cities in two different European countries. In each case, the PMS design and its use are shaped by a different process. Both cities implemented the same guidelines enacted at the European level but with a different local PMS development. Insights are shared on the process of PMS development. Notions as masculine and feminine culture and their relevance for governance structure are used to explain differences in PMS development. The main finding is that PMS follows structure. A multi-layer, multi-actor structured world forces the PMS into dialogue-based development.

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1. Introduction

European transportation reforms have considerably changed the way governments have dealt with the provision of the public transport from the 1990s onwards. Market mechanisms have been introduced through competitive tendering (Docherty et al., 2004). This movement is part of a wider appearance of private management styles in many other public sectors (Hood, 1991) with the principal aim to improve the quality of service and reduce associated costs.

Central to this movement, in relation to New Public Management (Hood, 1991), is the introduction of Performance Measurement Systems (PMSs), defined as 'the set of metrics used to quantify both the efficiency and effectiveness of actions' (Neely et al., 1995, p. 81). PMSs are a core mechanism in the modernisation of public services for setting targets and incentives, controlling private providers, externally accounting for performance, learning and continuously improving service provision (Behn, 2003; Johnsen, 2005).

PMSs have also been a cornerstone in the transportation reforming processes across Europe. Several studies have explored and discussed their merits in the past. These studies typically focus on technical aspects, such as the type of indicators (Hensher and Daniels, 1995; Badami and Haider, 2007; Nathanail, 2008; Chen et al., 2009; Börjesson and Eliasson, 2011; Mishra et al., 2012; Hassan et al., 2013), the use of targets and thresholds for setting

incentives (Hidas and Black, 2002; Marsden and Bonsall, 2006; Marsden et al., 2009) and the type of information required in performance-based contracts (Hensher and Stanley, 2003). These studies display the heterogeneity of PMSs, but they do not address the process by which these PMSs and their heterogeneity develop.

This paper looks into the process of PMS development, defined as the trajectory from design to redesign and from the initial use of the PMS to new ways of use. PMS development is an essential phenomenon, as the use of PMS will always bring issues to light that can be optimised in the PMS design. Real-world dynamics in transportation sectors cannot be adequately captured in a PMS that is entirely static. PMS development has been evidenced in other sectors (e.g. accounting) to have a high impact on the ultimate design of the PMS, its use and actors' processes of learning, both about the PMS and the service delivery (Preston et al., 1992; Chua, 1995; Gendron et al., 2007; Arnaboldi and Azzone, 2010).

PMS development is a multi-actor process (de Bruijn and ten Heuvelhof, 2008), since multiple actors discuss and decide over time on the PMS content, its structure and uses. These actors for example are the governments using the PMS as an instrument (referred to as service regulator), the companies providing services subject to the PMS (referred to as service provider) and the users of services. Though a PMS design can theoretically be decided unilaterally by a government, PMS use also depends on how companies provide information and respond to the PMS incentives. PMS development is shaped by this interaction between actors.

In this paper, we investigate how the PMS design and its use developed in two different cities in two different countries. Empirically, the research is based on two case studies, Milan and

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Table 1
Dimensions of PMS.

PMS design	KPIs, targets, and system of reports
PMS use	Type of use, data validation, data interpretation and effects
PMS development	Changes in PMS design and changes in PMS use

Amsterdam. These two European cities reformed their transportation sectors at more or less the same time. Trigger for the reforms was the enactment of European Union rules in 1991 to liberalise public transport. During the reforming process in both cases, there was never any discussion as to whether PMS was a useful instrument. Yet the modes through which the PMS was adopted, implemented, used and evolved were different in the two cities.

Results show a similar PMS design but a diverse use and surprising path of development, in particular with regard to the involvement of actors. The national culture, made visible in the governance structure, is used as explanatory lens to interpret the differences in PMS development.

2. PMS: linking design, use and development

The investigation of PMS development is grounded in the accounting literature (e.g. Preston et al., 1992; Chua, 1995; Gendron et al., 2007; Arnaboldi and Azzone, 2010) and starts from the assumption that PMS is shaped through three elements: design, use and development (Table 1). The first element of analysis is the *PMS design*, also referred to as the technical characteristics of PMS. Its key components are KPIs, targets with the associated system of bonuses and penalties, and a system of reporting (Otley, 1999).

Second element of analysis is *PMS use*, which involves the investigation of practices of interpreting and validating data and the real-world effects associated with PMS use. Data validation considers how the validity of the provided performance information is checked and by whom. PMS effects refer to the penalties, bonuses and other effects, both intended and perverse, triggered by the use of performance measures.

Third element of investigation is *PMS development*. This includes how actors, their mutual relationships, their competences and their involvement lead to evolutionary and other changes in PMS design and use.

Differences and similarities in PMS development can be explained considering the institutional settings, namely the national culture and the governance embedded into this culture (e.g. de Waal, 2005). A common dichotomy in literature on regulation styles (Hawkins 1983; Sparrow, 2000) is 'hierarchy' versus 'dialogue'. This dichotomy considerably overlaps with the dichotomy of 'masculine' and 'feminine' cultures (Hofstede, 1984). In our two case studies, according to Hofstede (1984), Italy has a masculine culture and the Dutch culture is relatively feminine. We further refine and elaborate on this explanatory lens when discussing the results below.

3. Research approach

In order to investigate the PMS development process, we adopted a multi-country case study (Yin, 1994). It is based on a longitudinal comparison, i.e. comparing cases over a time horizon of 15 years during the transportation reforming process of two European cities: Milan and Amsterdam. The case study methodology was selected because it is considered the most useful approach for understanding complex processes and the most

appropriate for conducting exploratory investigations (Yin, 1993). It gave us the possibility of entering in the details of PMS practice, its technical characteristics, its uses and its evolution over time.

3.1. Data collection, analysis and presentation

Data have been collected longitudinally from a wide variety of sources, including various documents, formal semi-structured interviews, informal conversations and site visits. Particularly semi-structured interviews allow focusing on the specific research interests, to open up the real-world context of PMS (Weiss, 1995).

Several documents have been analysed, such as laws, official reports, internal reports, media articles and scientific studies directly relevant to the cases (e.g. Veeneman, 2010). Legislative decrees, national laws and regional laws on public transport have been collected and analysed to understand the legislative reference context. Official reports include annual financial reports and mobility charts published periodically on the website of the transportation companies in Milan and Amsterdam. This data source provided insights to explore PMS design in terms of KPIs adopted. Internal reports relate to documents on PMS internally developed by the service providers for the regulators and not available to users. These reports showed evidence on PMS design with specific reference to KPIs and targets.

For each case, interviews were carried out with local government authorities and managers of the service providers. In total, we conducted 31 interviews during the period 2009–2012. Interviews lasted on average 1 h, and were transcribed and textually analysed in order to identify any interesting pattern among the interviews. A summary was then sent to each interviewee for further clarifications and the final approval. Additionally, site visits in local administrations, offices of the transportation companies and of users' representatives proved insightful. Informal conversations also were particularly useful to gain additional information on PMS design and use and validate insights from formal interviews.

The Amsterdam results were based on two interviews, but the case relied on a wider set of empirical data, which included multiple official and internal reports and previous research (Veeneman, 2010). The choice of the empirical strategy was due to large availability and accessibility of documents on the investigated issue. Furthermore, for the Amsterdam case, an extra interview was carried out with an expert to reflect on the validity and completeness of previous collected material. The Milan case required a different strategy. The reports available for the researchers were not sufficient to investigate the phenomenon. Moreover, the reconstruction of the PMS design and implementation required to interview many actors, each of them having a partial vision on the system.

3.2. Introducing the cases: Milan and Amsterdam

Milan is the second largest municipality in Italy and the capital of the Lombardy Region. The city represents an important transport node for the country, being one of the most important hubs for air, rail, and road networks, and local public transport. There are 4,757,000 travellers every day (Agenzia Milanese Mobilità e Ambiente, 2006), of whom 53% travel entirely within the municipality, with the remaining 47% entering and exiting the city.

The local public transport serves an area of 703 km² with 2,754,258 inhabitants (see Table 2). The urban transport network consists of 97 bus routes, 19 tram routes, 3 metro routes and 3 trolley bus routes providing the service both inside the city and between the city and the nearby 51 provincial towns.

ATM, a public limited company owned by the municipality, is the service provider. The company was founded in 1931, when it

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