


# Understanding the Extent of Automation and Process Transparency Appropriate for Public Services: AI in Chinese Local Governments

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## ABSTRACT

Many countries are exploring the potential of artificial intelligence (AI) to improve their operations and services, and China is no exception. However, not all AI techniques or automation approaches are suitable for every government service or process since transparency and accountability are paramount in the public sector. In this context, automation via expert systems (ES) is still a vital complement or even an alternative to AI techniques, because they can be more easily audited for potential biases. This paper analyzes the smart examination and approval (SEA) process use in China and explores how different forms of automation could be better options for certain services or specific processes within services, considering their level of transparency as an important characteristic. Based on these results, the authors argue that governments could consider hybrid approaches combining, for example, machine learning, for verification processes, and ES, which are more easily auditable, to make final decisions on individual cases. They also propose a classification of services by considering the extent of automation and process transparency needed. The classification considers a hybrid approach such as SEA, but also include other alternatives such as the exclusive use of AI techniques, as well as traditional online delivery and face-to-face procedures.

## KEYWORDS

Artificial Intelligence, Automated Decision-Making, Chinese Local Government, Expert System, Facial Recognition, Machine Learning, Public Services, Smart Examination and Approval

## 1. INTRODUCTION

In the age of artificial intelligence (AI), governments around the world are exploring new techniques and applications to deliver services at lower cost and with better quality to citizens. There are many types of AI techniques and applications, each with its own advantages and disadvantages. In China, the rapidly spreading initiative “Smart Examination and Approval” (SEA) is an interesting

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government innovation based on AI. SEA was first promoted by Guangxi Province in 2017 and has some distinguishing features, such as applying online without paper materials, automatic examination and approval by the system using pre-coded rules, and obtaining results immediately (Tong & Zhou, 2017). No doubt, these are important benefits to citizens. However, as the application of SEA normally requires a significant IT investment and large volumes of individual data, it is important to better understand its potential, as well as the challenges governments face when using AI innovations compared to more traditional forms of service delivery. In addition, this is not unique to China since governments from around the world are increasingly using AI-based systems and not enough is known about their potential benefits and challenges for government and society.

Studies from all over the world aim to discuss public service delivery using different perspectives. Smart city is a typical concept used and involves all kinds of technology innovations including AI (Anthopoulos et al., 2016). In fact, scholars have specifically analyzed how cities are using smart city and smart government applications in countries such as Korea (Nam, 2019), Singapore (Karippur, 2020), India (Kandpal, 2018), and Cyprus (Pereira et al., 2016). It also seems clear, that any digital services initiative needs to fulfill certain requirements in order to be successful (Janssen et al., 2018; Rana et al., 2016). While the logic is a little bit different in China where citizens tend to welcome all innovations targeting efficiency-improvement, it is still important to consider what has been found in previous research regarding public service delivery and innovations in cities.

In the traditional service-delivery model, there are disadvantages for citizens because the applicant is physically transferring application materials by visiting one agency after another. During this process, the applicant spends a lot of time and money completing multiple tasks in different locations. This is particularly problematic when the applicant must travel from one city to another—many of which are in remote areas—and back again. The lack of available transportation and the time necessary to commute have been recognized as measures of public service quality (Lee & Braham, 2020). Furthermore, some government employees demand bribes from the applicants to process their paperwork. One study found connections to corruption in both one-shot services and services with frequent interactions, such as yearly renewals of building permits (Ryvkin & Serra, 2018). However, two advantages of traditional face-to-face services are that the results are perceived by the customer as more effective (Vehkasalo, 2020) and they help to bridge the digital divide (Moon et al., 2012).

When scholars talk about AI in government, they analyze public services through the study of different government functions and diverse AI techniques. Looking at AI-based government systems, there are four types of tasks for which this technology is used. The first approach is to use AI to identify situations such as fraud (Srivastava et al., 2014), sustainable areas (Gigović et al., 2016), and pollution (Adams & Kanaroglou, 2016; Cabaneros et al., 2017). The second method uses AI to assess measures like work effectiveness (Omoteso, 2012), credit risk (Vlah Jerić & Primorac, 2017), and fertilizer use (Nabavi-Pelesaraei et al., 2016). The third type of task is to measure when AI is implemented to gauge and optimize energy consumption (Grant et al., 2014; Ruiz et al., 2016), water quality (Khataee & Kasiri, 2010; Burchard-Levine et al., 2014), and public transportation (Kouziokas, 2017). Finally, the fourth use is prediction; here, AI is utilized to forecast behavior and needs (Saeedi, 2018), crime patterns (Alves et al., 2018), or the spread of disease (Zhang et al., 2015).

The above tasks that have successfully implemented AI technologies have a couple of features in common—no specific individual is affected by the decision made through programs. Rather, the uses involve general decisions about a population or society as a whole. However, for services that include a human decision-maker or that consider whether, for example, a specific applicant is legally qualified to obtain a driver's license, a low-income allowance, or a business license, the situation should be treated differently. In this paper, we focus on government services in which a legal decision about an individual is made by a human authority, and we explore the potential of applying AI technologies—particularly the SEA strategy—to those services. Therefore, the purpose of this paper is to better understand in which situations automated decision-making (ADM) is possible and desirable

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