

# Citizens' trust and digital attitudes: evidence from city digital transformation in Shanghai, China

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## Abstract

**Purpose** – Based on the theory of trust and cost-benefit perspective, this paper examines the relationship between citizens' trust and their digital attitudes by considering the mediating effects of performance expectancy and perceived risk, as well as the moderating effect of media use.

**Design/methodology/approach** – The city digital transformation in Shanghai is chosen as the case in this study. 466 questionnaires were collected through a survey, with Structural Equation Modeling to test the hypotheses in AMOS.

**Findings** – Citizens' trust of government and trust of technology has no significant direct effect on their digital attitudes. However, performance expectancy mediates between the trust of government and digital attitudes, and perceived risk mediates the effect of trust of technology on attitudes. The use of social media significantly moderates the association between trust of technology and citizens' attitudes.

**Originality/value** – Exploring why citizens shape supportive attitudes toward digitalization is critical to achieving digital governance goals in developing countries, especially large cities where digital transformation is accelerating. The originality lies in using cost-benefit analysis as a perspective and media use as a moderator to examine the mechanisms of citizens' trust and digital attitudes.

**Keywords** Trust, Digital attitudes, Citizen engagement, City digital transformation, Cost-benefit analysis, Shanghai, China

**Paper type** Research paper

## Introduction

Digitalization is affecting human society with an irreversible trend. Information technology has become the driving force of modern state development, and the change triggered by technology can be called digital transformation. This phenomenon is particularly obvious in developing countries (Alkrajji and Ameen, 2022; Tassabehji *et al.*, 2019). In China, Shanghai has initiated the city digital transformation, emphasizing technological embedding, structural reform, and value creation. City digital transformation is committed to promoting service process simplification through emerging technologies, gaining insights into public demands to provide precise services (Curtis, 2019), and pursuing people-centric development (Ji *et al.*, 2021).



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Various studies have shown that digital transformation is a complex process that requires the involvement of governments and other stakeholders in developing strategies (Ziozias and Anthopoulos, 2022). In the context of smart city, some scholars have identified research gaps in ICTs governance and have indicated the importance of open data for digital government and trust (Claudio Diogo Reis *et al.*, 2021). Similarly, a collaborative government approach to develop and monitor the implementation of digital government strategies is crucial for the city digital transformation (Mahmoud Ali and Meyerhoff Nielsen, 2021). The goal of digital transformation is to narrow the boundaries of governments, which is important for citizens' trust and digital attitudes, but may also lead to conflicts between central and local governments. These literatures reveal the relationship between government, technology, and citizens in the city digital transformation.

Citizens' digital attitudes represent their perceptions of programs, policies, technologies, and even various actors in digital transformation. As digital transformation is a series of government projects, citizens' attitudes largely determine the outcome of transformation. Some studies have found that the development of information technology may trigger positive or negative public opinions (Janssen and Kuk, 2016). City digital transformation can improve governance, promote economic growth, and enhance city competitiveness; it will also bring negative concerns, such as information leaks, digital divide, and cost burden (Jang and Gim, 2022). Therefore, citizens' attitudes toward digital transformation are still being determined.

The factors influencing citizens' digital attitudes have received attention (Park and Chen, 2007; Zhang *et al.*, 2014). Trust is the expectation that individual or group is committed to being relied on, which has been explored as an essential element in studies on the digitization of government services in developing countries (Li, 2021). However, it is hard to understand trust accurately if we discuss citizens' trust in a general view (Esaiasson *et al.*, 2021). Some scholars distinguish citizens' trust from cognitive and affective perspectives (Miao *et al.*, 2014), but less attention is paid to the trust of different actors in city digital transformation. Based on a questionnaire survey conducted in Shanghai, this study addresses the following questions: Does citizens' trust affect their digital attitudes? If so, how does it work? Data from Shanghai were used to enrich micro-study of city digital transformation and to provide insights for policy practice.

## Literature review

### *Trust and citizen engagement in the digital age*

The concept of social capital has been used in psychology, management, political science, and other disciplines because of its proven benefits for economic, social, and public policy improvement (Adler and Kwon, 2002). Social capital is defined as "the actual and potential resources that actors have in the structure of their social relationships", and it includes networks or cooperation as well as trust and reciprocity norms (Putnam *et al.*, 1992). Thus, trust is an essential part of social capital theory and is related to individual behavior and social development. Expectations and beliefs about the intentions and trustworthiness of others are elements in most definitions of trust (Cairney and Wellstead, 2021).

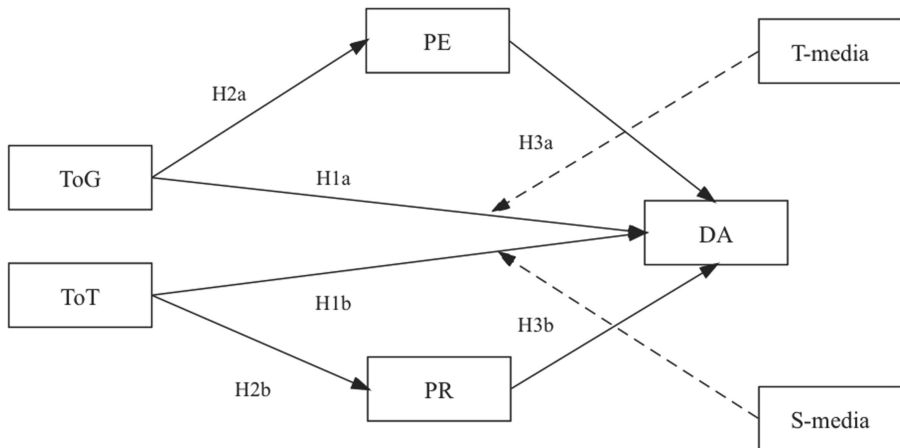
Previous work has described trust formation around cultural, social, and economic foundations, but the digital age emphasizes the technological foundations of trust. As information technology has evolved from the Internet to Big Data and Artificial Intelligence, more studies have focused on how technology shapes trust and how trust affects technology adoption (Mostafa and Kasamani, 2022), which have been conducted from two approaches. The first is to explore the impact of information technology on the types and content of trust, such as smart trust, digital trust, and technology trust (Mcknight *et al.*, 2011). Second, several developing countries are moving towards an era of digital governance, which makes it urgent

to discuss whether information technology plays a positive or negative role in trust (Khan *et al.*, 2017; Li, 2021).

When turning the perspective to the field of public administration, existing studies have also analyzed the roles of trust. For example, it is argued that trust positively impacts collaborative governance and citizen engagement based on social capital theory (Warren *et al.*, 2015). Some others took trust as a dependent variable to analyze why citizen engagement affects it (Cairney and Wellstead, 2021). Among the mediating role studies, it was found that trust mediates between the perception of risk of AI and public participation (Choung *et al.*, 2023). In the context of the integration of information technology into and its influence on the social networks of multiple actors such as government, citizens, and enterprises, scholars have gradually focused on trust and citizen engagement related to digital government, e-government, and digital public services (Carter and Bélanger, 2005; Mahmood, 2016). These studies analyze the relationship between trust and changes in citizens' attitudes and behavior.

*Research gaps*

Several research gaps can be identified from the literature review. First, although studies have explored the role of trust in citizen engagement (Alkrajji and Ameen, 2022; Smith *et al.*, 2013), there is less concern about how it affects. Second, scholars focus more on trust and citizens' behaviors in a general setting. In the context of city digital transformation, it is necessary to enrich the studies on trust and citizen support. Third, relevant studies in developing countries are more concerned with citizens' acceptance and use of technology or platforms (Zhu *et al.*, 2021; Ziba and Kang, 2020). While there are studies on the city digital transformation, little is known about its situation in China. As governments apply information technology to improve governance and pursue "people-centered" public values (Ji *et al.*, 2021; Khan and Krishnan, 2021), exploring how citizens develop supportive attitudes toward digitalization will be essential for achieving transformation goals. The author thus proposes the hypotheses based on these gaps (Figure 1).



Note(s): ToG = trust of government, ToT = trust of technology, PE = performance expectancy, PR = perceived risk, DA = digital attitudes, T-media = use of traditional media, S-media = use of social media.

Source: By author

**Figure 1.**  
Research model

## Research hypotheses

Trust in smart cities or digital public services is linked to government, technology, and risk (Papadopoulou *et al.*, 2010). In the case of e-government, citizens' trust can be divided into trust in the public sectors that provide services and trust in digital platforms or technologies that provide information, such as the Internet, government websites, and mobile government APPs (Li, 2021). Because the remote and contactless services enabled by digitalization require a premise of citizens' trust in the organizations that provide them, which means that transparent and open interactions between government and citizens will enhance citizens' trust and acceptance of digital transformation. Trust in the public sector is therefore usually seen as a key predictor of e-government adoption and policy support (Carter *et al.*, 2016; Carter and Bélanger, 2005). In addition, the digital transformation process may also face uncertainties triggered by Big Data and Artificial Intelligence. Lack of technological trust is a challenge for city digital transformation, especially in scenarios involving financial or private information (Carter and Bélanger, 2005). Based on the literature review, the following hypotheses were proposed.

H1a: Citizens' trust of government positively influences their digital attitudes.

H1b: Citizens' trust of technology positively influences their digital attitudes.

Most studies on government, technology, and citizens explore why citizens adopt or use government-provided technology platforms and public services based on the Technology Acceptance Model and Diffusion of Innovation Theory (Al-Hujran *et al.*, 2015). These analytical frameworks have been widely applied in micro-level analyses of e-government, digital government, and digital transformation in China and Western contexts (Li, 2021). From a cost-benefit perspective, performance expectancy is the utility citizens believe they can derive from city digital transformation, and perceived risk is the potential costs they may have to pay. Trust is vital in changing citizens' perceptions of risk and uncertainty (Li *et al.*, 2008). When citizens trust the public sector and information technologies in digital transformation, the perceived risk could be decreased (Bélanger and Carter, 2008). Trust also enables citizens to believe that service providers have the ability and integrity to provide quality services (Zhou, 2014). Therefore, this study incorporates citizens' trust into this mechanism. When citizens trust the public sector that implements city digital transformation programs, they are likely to have higher expectations of the usefulness of the policies and support digital initiatives; citizens' trust in technology may also influence their risk perceptions and digitalization attitudes. The following hypotheses can be proposed.

H2a: Citizens' trust of government influences their digital attitudes through performance expectancy.

H2b: Citizens' trust of technology influences their digital attitudes through perceived risk.

The rapid development of information technology has expanded citizens' channels of online access to information and services. Scholars studying digital public services have found that media has a more significant impact than interpersonal communication (Dimitrova and Chen, 2006). Some studies argue that the more informed citizens are, the more trustful they are of government and the more likely they are to accept technology or related public services (Buell and Norton, 2013). However, differences in information sources can affect their perceptions of new technologies and controversial issues (Cui and Wu, 2021). Traditional media usually consists of newspapers, magazines, and television news. They are always considered to present information reliably and are more trusted by citizens to publish information on politics or policies (Johnson and Kaye, 2014). Social media generally refers to information channels or platforms built on the Internet. In China, people can obtain information through

platforms like Weibo and WeChat public accounts (Gong Zhong Hao). The opinion-oriented content of social media would trigger citizens' interest perceptions and policy support for digital transformation (Cui and Wu, 2021).

H3a: The use of traditional media moderates the relationship between citizens' trust of government and digital attitudes.

H3b: The use of social media moderates the relationship between citizens' trust of technology and digital attitudes.

## Methodology

### *Samples and data*

China is one of the developing countries to initiate e-government. Traced to the 1980s, China's governmental information institutions have gradually developed. In 1983, the central government established the information management office, which was responsible for planning and constructing the national information management system and the overall laws and regulations. China launched the "Three Gold Projects" around constructing information technology infrastructure and communication networks in 1993. The leading group on cybersecurity and informatization was established in 2014 to drive the development of e-government into a new era. Overall, China's digital transformation is in the exploratory stage, which is universal and specific compared to other developing countries. For example, China's top-level digital strategy is formulated by the central government, and under the guidance, local governments implement digital programs appropriate to their conditions, including "overall smart governance" in Zhejiang, "digital pioneer city" in Shenzhen, and "One Network for All" in Shanghai. When local governments' digital initiatives become effective, the central government will push for and promote them. In particular, the central and local governments in China are attempting to address the lack of transparency of information systems, the ineffectiveness of government platforms, and the lack of accountability of the public sectors in order to gain over citizens' trust and support as they face digital transformation.

Shanghai is chosen as a basis to investigate the mechanisms of citizens' trust and digital attitudes for the following reasons: First, Shanghai is considered a typical city for digital transformation in China because of its distinctive characteristics. Its digitalization program, which to some extent reflects China's digitalization strategy, is written into the government work report. However, Shanghai's digital transformation has also suffered from weaknesses that most Chinese cities have, such as barriers in the public sector and duplication of platforms. Second, Shanghai is one of the four directly controlled municipalities in China, and its local digital government projects are more easily observed than in normal cities. Third, Shanghai's digital transformation involves three dimensions: economy, governance, and life, and has a greater impact on citizens. Thus, this study can provide insights into how to handle the relationship between citizens' trust and digital attitudes in developing countries, especially in cities with rapid digital transformation.

A survey was conducted in Shanghai from August to September 2021. The questionnaire was collected through a research platform "Netease DINGWEI". The samples were selected by location verification and questions set for validity testing. After excluding 110 questionnaires that did not match the location requirements, a total of 562 questionnaires were collected. The questionnaires were then selected based on response time, extreme values and test items and finally obtained 466 questionnaires with a valid recall rate of 82.92 percent.

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### Measurements

The measurement scales for each variable from previous studies were drawn. The measurement scales were initially developed in English. All scale items were translated into Chinese using standard translation-back-translation methods and invited scholars in the field of digital government and e-government to make corrections. All variables predicted in the study except media use were measured on a five-point Likert scale, with 1 being strongly disagree and 5 being strongly agree.

#### (a) Citizens' trust

This study defines citizens' trust in city digital transformation as individuals' confidence in the dependability of a specific actor, which is distinguished into the trust of government (ToG) and the trust in technology (ToT). The scale of ToG is adopted from the research findings of [Habib \*et al.\* \(2020\)](#). The four items used in this study to measure ToG have a Cronbach's alpha of 0.89, with one of the items being, "Government always prioritizes the interests of its citizens." With a total of four items, [Carter and Bélanger \(2005\)](#) measured ToT and obtained a Cronbach's alpha of 0.92. One of the items is, "City digital transformation provides secure applications, functions, and services."

#### (b) Performance expectancy

Performance expectancy (PE) is the extent to which individuals believe that actions will help improve their task performance. This research adopted four items to measure PE used by [Venkatesh \*et al.\* \(2010\)](#) and [Mansoori \*et al.\* \(2018\)](#). The Cronbach's alpha of this scale is 0.87. One of the items is, "Using the applications, features, and services of the city digital transformation will improve the efficiency of my business."

#### (c) Perceived risk

Perceived risk (PR) is considered to be the individual's perception of the uncertainty and adverse consequences associated with the use of technology, services, etc. This study employed a four-item scale to measure perceived risk, used by [Martins and Oliveira \(2014\)](#) in the context of technological innovation. An example item is "Many uncertainties are associated with using an APP, technology, or service related to city digital transformation."

#### (d) Citizens' digital attitude

Attitude as a psychological condition has been widely explored in various disciplines, and citizens' digital attitudes are defined as individuals' views on the government, policies, technologies, and platforms involved in digital transformation. Citizens' digital attitudes (DT) were measured by five items ([Chen \*et al.\*, 2016](#); [Park and Chen, 2007](#)), in which Cronbach's alpha is 0.94. An example item is, "I think the city digital transformation program proposed by the government is a good idea."

#### (e) Media use

Media use is divided into the frequency of traditional media (T-media) use and the frequency of social media (S-media) use. Respondents were asked to answer two 7-point scale items to obtain more accurate results, "Please rate how often you get information through traditional (social) media." with 1 indicating never and 7 indicating always.

#### (f) Control variables

Consistent with the previous studies ([Al-Hujran \*et al.\*, 2015](#); [Li, 2021](#); [Zhang \*et al.\*, 2014](#)), respondents' demographics (age, gender, social economic status, and educational level) were used as control variables.

*Data analysis strategy*

This study ran Structural Equation Modeling (SEM) in AMOS to examine the measurement models and structural relationships. The SEM analysis strategy provides both outcomes of factor analysis and regression analysis (Hair *et al.*, 2007). In addition, AMOS can process complex correlations, such as mediation and moderation.

*Robustness checks*

The potential effect of multicollinearity in the research data set was investigated, and the outcomes show a little impact of multicollinearity (VIF = 0.56 for ToG, 0.60 for ToT, 0.69 for PE, 0.86 for PR, 0.83 for T-media and 0.80 for S-media). Furthermore, common method bias (CMB) was assessed using guidelines of Podsakoff and Mackenzie (2003). Harman single-factor method was used. There are four factors with eigenvalues higher than 1, with a total accumulated variance contribution of 58.60 percent. The variance extracted for the first factor is 33.13 percent, which is less than 40 percent of the cut-off criterion. Thus, CMB do not exist in the study.

**Results**

*Descriptive statistics and correlation*

Table 1 depicts the characteristics of the final respondents (466). 41.2 percent are male, and 58.8 percent are female. Based on respondents' educational level, 299 (64.16 percent) have a bachelor's degree, and 62 (14.16 percent) hold a master's degree or above. Table 2 shows the correlations of the main variables. The results support the prediction and indicate that structural analysis can be conducted.

Variables	Frequency	Percentage
<i>Gender</i>		
Male	192	41.20
Female	274	58.80
<i>Age</i>		
Below 20	5	1.07
20-30	109	23.39
30-40	269	57.73
40-50	58	12.45
Above 50	25	5.36
<i>Educational level</i>		
Junior high school (or under)	3	0.64
Senior high school	26	5.58
Three-year college	72	15.45
Bachelor's degree	299	64.16
Master's degree	62	13.30
Doctoral degree	4	0.86
<i>Annual income (RMB)</i>		
Below 30,000	37	7.94
30,000-100,000	85	18.24
100,000-200,000	207	44.42
200,000-300,000	94	20.17
300,000-500,000	30	6.44
Above 500,000	13	2.79

**Table 1.**  
Respondents'  
demographic

Source: By author

*Model evaluations*

The values of factor loading (FL), composite reliability (CR), Cronbach's alpha (CA), and average variance extracted (AVE) were applied to assess validity and reliability following the suggestions of Hair *et al.* (2007). All measures are validated as reliable because the CR and CA values are over the threshold for a reliable instrument (0.70). Additionally, FL and AVE values exceed 0.70 and 0.50, respectively, demonstrating the convergent validity of the study instruments (Table 3).

As shown in Table 4, the structural model's results (CFI = 0.915, NFI = 0.863, GFI = 0.901, RMSEA = 0.055,  $\chi^2/df = 2.383, p = 0.000$ ) indicate that it is well-fitting and meets the cut-off criterion suggested by Hair *et al.* (2009).

*Mediating effects*

After the structural model was accepted, the maximum likelihood approach in AMOS was used to estimate the standardized path values (Table 5). The results suggest that citizens' trust of government significantly influences their performance expectancy ( $\beta = 0.547, p < 0.05$ ) and that

Variables	Mean	SD	ToG	ToT	PE	PR	DA
ToG	4.357	0.592	-				
ToT	4.286	0.621	0.596***	-			
PE	4.449	0.463	0.507***	0.411***	-		
PR	3.071	0.969	-0.264***	-0.300***	-0.281***	-	
DA	4.457	0.445	0.474***	0.349***	0.708	-0.312***	-

Note(s): N=466. \* $p$ -value<0.05, \*\* $p$ -value<0.01, \*\*\* $p$ -value<0.001.  
Source: By author

**Table 2.**  
Correlation analysis

Variables		Loadings	Estimates	S.E	Alpha	C.R	AVE
ToG	ToG1	0.741	1		0.83	0.838	0.565
	ToG2	0.67	0.949	0.069			
	ToG3	0.773	1.168	0.073			
	ToG4	0.816	1.173	0.07			
ToT	ToT1	0.739	1		0.86	0.846	0.579
	ToT2	0.738	1.303	0.086			
	ToT3	0.79	1.203	0.075			
	ToT4	0.776	1.259	0.08			
PE	PE1	0.668	1		0.74	0.817	0.531
	PE2	0.607	0.923	0.082			
	PE3	0.778	1.005	0.079			
	PE4	0.841	1.046	0.088			
PR	PR1	0.79	1		0.87	0.866	0.618
	PR2	0.729	0.884	0.056			
	PR3	0.811	1.007	0.057			
	PR4	0.814	1.034	0.058			
DA	DA1	0.726	1		0.84	0.848	0.528
	DA2	0.756	1.025	0.099			
	DA3	0.774	1.096	0.089			
	DA4	0.682	0.873	0.091			
	DA5	0.699	0.985	0.096			

Source: By author

**Table 3.**  
CFA results



performance expectancy also has a significant positive effect on citizens' digital attitudes ( $\beta = 0.918, p < 0.05$ ). Meanwhile, there is a negative relationship between trust of technology and citizens' perceived risk ( $\beta = -0.704, p < 0.05$ ), and perceived risk can reduce citizens' digital attitudes ( $\beta = 0.059, p < 0.05$ ). However, the results do not report a significant impact on trust of government and trust of technology on citizens' digital attitudes ( $\beta = -0.036, p > 0.10; \beta = -0.062, p > 0.10$ , respectively). Thus, H1a and H1b could not be supported.

To estimate indirect effects, this study conducted the mediation analysis using the bias-corrected bootstrap (2000 iterations) method according to Hayes and Preacher (2010). As is shown in the mediation results (Table 5), performance expectancy is a significant factor in the indirect association between citizens' digital attitudes and trust in the government (indirect effect = 0.502, CI = 0.075 to 0.343), thus supporting H2a. Similarly, trust of technology can affect attitudes (Indirect effect = 0.101, CI = 0.017 to 0.763) through perceived risk. This finding supports H2b. Hence, the mediation analysis confirms significant associations between citizens' trust and digital attitudes through a cost-benefit consideration.

*Moderating effects*

The moderating effect of media use was further examined (Table 6). First, this study centered the independent and moderating variables and then multiplied the independent and

**Table 4.**  
Model fitness  
indicators

Fitness indices	CMDI/DF	CFI	RMSEA	P-value	NFI	GFI
Structural model	2.383	0.915	0.055	0.000	0.863	0.901
Cut-off criterion	<3	>0.80	<0.08	<0.05	>0.80	>0.80

Source: By author

**Table 5.**  
Mediation results

Paths	Estimate	S.E	Lower CI 95%	Upper CI 95%	p-value
ToG→PE	0.547	0.079	0.401	0.715	0.001
ToT→PR	-0.704	0.102	-0.926	-0.519	0.001
PE→DA	0.918	0.139	0.697	1.231	0.001
PR→DA	-0.059	0.019	-0.097	-0.023	0.001
ToG→DA	-0.036	0.097	-0.227	0.175	0.660
ToT→DA	-0.062	0.080	-0.233	0.071	0.438
	Indirect effects	S.E	Lower CI 95%	Upper CI 95%	p-value
ToG→PE→DA	0.502	0.014	0.075	0.343	0.001
ToT→PR→DA	0.042	0.101	0.017	0.763	0.001

Source: By author

**Table 6.**  
Moderation results

Paths	Path coefficient	S.E	C.R	p-value	Results
ToG→DA	-0.036	0.097	-0.445	0.660	Not significant
T-media→DA	0.015	0.010	1.601	0.109	
ToG*T-media→DA	0.918	0.139	0.697	1.231	
ToT→DA	-0.062	0.080	-0.959	0.338	
S-media→DA	0.015	.010	2.008	0.045	
ToT*S-media→DA	0.041	.014	2.886	0.004	Significant

Source: By author

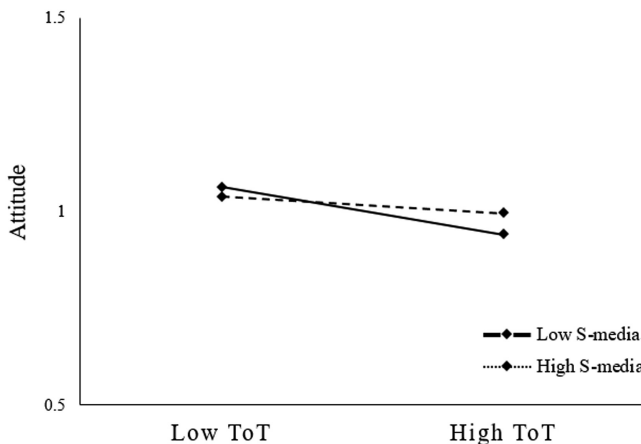
moderating variables to construct interaction terms. The results indicate that the use of traditional media has no moderating effect on the relationship between trust of government and attitudes. Meanwhile, the use of social media positively and significantly moderates the association between trust in technology and citizens' digital attitudes. Thus, H3a could not be proved, while H3b is supported.

To illustrate the moderating effect more clearly, respondents were divided into two groups, those with low and high social media use, and then graphed. Figure 2 suggests that social media use has a more significant impact on citizens with a high level of technology trust than those with a low level of technology trust.

**Discussion and conclusion**

This paper aims to investigate the impact of citizens' trust on their digital attitudes from a cost-benefit perspective. The results show no direct effect of citizens' trust on their digital attitudes. This is different from the findings of previous studies (Carter and Bélanger, 2005; Mansoori et al., 2018). A possible explanation is that while e-government has been developed in China for decades, Shanghai's city digital transformation program has been proposed for a short time and covers a more complex area where citizens' understanding is still relatively limited. Citizens' trust of government and technology depends on specific technological tools and perceptions to convert into their attitudes and behaviors toward digital policy.

First, citizens' trust of government affects digital attitudes through performance expectancy, which is consistent with most existing studies (Khan et al., 2017; Li, 2021; Mansoori et al., 2018). Performance expectancy indicates the benefits that digital transformation can bring to citizens, such as increased efficiency in accessing high-quality public services. In countries such as China, the government still primarily dominates the production and delivery of public services. Therefore, citizens' trust of government is correlated with performance expectancy, which undoubtedly affects their attitudes toward the policy proposed by the government. Second, trust of technology affects digital attitudes through perceived risk, which supports the findings of some previous studies (Xie et al., 2017; Zhu et al., 2021). Perceived risk implies citizens' expectations of potential costs, like privacy leaks and economic damages. As citizens become more trustful of technology, their risk perceptions decrease, and hence their attitudes should become more positive.



Source: By author

**Figure 2.** Moderating effects of social media use

Moreover, it has become a trend for the media to intervene in digital life (Mu *et al.*, 2022). The conclusions show that the use of traditional media does not have a moderating effect; instead, the use of social media has a significant positive moderating effect. One possible reason for this is that traditional media in the China context convey more standardized and authoritative information (Chen and Sun, 2019). However, more is needed to enable citizens to perceive the convenience of digital public services. In Shanghai, much of the information about the city digital transformation is disseminated on social media, such as public websites and various APPs, which means that social media are more directly related to the city digital transformation. When citizens use these social media to receive positive information, they will be more likely to perceive the advantages and convenience of digital transformation.

While many developing countries have made achievements in the digital transformation of public services, they are also challenged with an urgent and practical issue: How to improve citizens' attitudes toward digitalization and increase their participation as digital transformation accelerates? Early studies on citizen engagement in a digital context focused on the two main areas of digital government or e-government (Ziba and Kang, 2020). Citizens' trust should not be neglected in a society where government and citizens interact in an orderly way, that is, whether citizens support the digital programs proposed by the government is a topic worth exploring.

The theoretical implications of this paper are two-folded. First, city digital transformation begins with government practices, and scholars are more concerned with macro-level issues. For developing countries, micro-level studies on citizens are still lacking. From a cost-benefit perspective, social capital theory and trust theory are used to explore the relationship between citizens' trust and digital attitudes in the context of city digital transformation in Shanghai, enriching the study of trust and citizen participation in the digital era. Second, an analytical framework based on cost-benefit perceptions is proposed. Which, performance expectancy and perceived risk are individual psychological factors, while media use is social factor. The importance of considering citizens' trust not only in terms of both government and technology dimensions but also in relation to citizens' perceptions of public services and information technology and the role of the social environment.

Exploring the impact and mechanisms of citizens' trust in digital attitudes can guide the public sector to optimize digital policy and improve public service practices. First, building a trustworthy image of government and technology can raise performance expectancy and reduce perceived risk. The more citizens trust the government, the stronger the perception that policy is in their interest, and the more they take positive support actions. Technology trust serves to help citizens avoid excessive risk concerns, so confidence in a government's ability to deliver secure digital public services is a motivator for developing positive attitudes. During the COVID-19 pandemic, for example, many city governments, including Shanghai, launched digital health services, such as health codes and tripcodes. However, health codes in some provinces like Shandong and Fujian crashed and users were unable to open them, at the same time, rumors that there was a risk of information leakage when using those codes were spread. Relevant local authorities in some cities did not deal with these problems promptly, leading citizens to develop negative attitudes; while governments in other cities that quickly fixed technical problems and dispelled rumors were better able to promote the technology and digital health programs.

Second, considering the advantages of social media, governments, and societies should consider conveying information about the city digital transformation to citizens through social media. As the public sectors become active on social media, explanations of city digital transformation and its benefits can expand the acceptability of policies. Social media can deliver information quickly and directly, and more diverse and novel content on digital policy will enhance perceptions of the positive effects of digital transformation. As of December 2022, China had 926 million users of online government services, over 130,000 government

websites including the central government, 145,000 government microblogs (Weibo), and every provincial government has built a government services APP. Thus, local governments should effectively use social media and digital platforms when advocating their digital programs to demonstrate to citizens the public value and personal benefits, such as providing more digital public services. The central government should not only make overall strategic plans for digital transformation but also provide more authoritative and positive interpretations through official social media, like People's Daily and Xinhua Agency's WeChat public accounts.

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