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RESEARCH ARTICLE

Predicting Organizational Performance Through Digital Design Tool Adoption in Chinese Graphic Design Agencies

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ABSTRACT

This research examines creating a model that would forecast the organizational performance of the top Chinese graphic design agencies, given that they have adopted digital design tools. Accordingly, it posits Perceived Attributes of Digital Design Tools (PADDT), Organizational Readiness Factors (ORF), and External Environment Influences (EEI) as independent variables. At the same time, Employee Acceptance of Digital Tools (EADT) and Changes to Workflows and Processes (CWP) are the mediator variables. Also, Organization Size (OS) is tested as a control variable. This study adopted a quantitative research method to obtain data from 432 graphic design professionals in China, and SEM analysis was used to test the relationships between the constructs. This study established organizational readiness and external influence using digital tools to improve organizational performance. This research fills the gap in the current literature by offering a detailed theoretical framework that incorporates both technology acceptance theories and recommendations for practical use in industries. The findings provided are valid policy prescriptions for managers planning to enhance organizational output by harnessing the power of technology tools.

Contribution/Originality: This study contributes to the existing literature by integrating TAM, DOI, and CTC theories to predict organizational performance in Chinese graphic design agencies. It uses SEM analysis to evaluate mediating and moderating variables, documents a detailed adoption model, and is among the few linking digital tool adoption to cultural and contextual performance factors.

1. Introduction

The digitization of graphic design agencies is one of the critical drivers of organizational performance and competitiveness in today's business environment. Digital design tools have transformed the working models of new economy creative industries, especially in fast-growing emerging markets like China. The addition of sophisticated digital

technologies in graphic design processes has become a critical necessity for agencies experiencing new environments in the marketplace (Liu, 2023).

Current studies on Chinese graphic design agencies revealed that the agencies that have adopted the range of tools that expand digital technologies saw productivity and quality in their agencies increase significantly. This paper uses the China Design Industry Report to show that the digital design software market was ¥15.2 billion in 2023, up from ¥5.4 billion in 2019 (Zhang & Lin, 2022). In addition, the China Creative Industry Association found that agencies with established digital features achieved 45% more productivity than conventional design studios (Wang, 2023).

Scholars Marion and Fixson (2021) explain that changes to design processes due to the integration of digital technology have impacted project delivery time, client satisfaction, and design creativity in organizations. A survey conducted by the Chinese Design Innovation Center showed that the agencies using integrated digital design platforms experienced a 60% decline in revision cycles and a 40% improvement in client satisfaction rates (Su, 2013). However, the use of digital tools inconclusively impacted organizational performance due to several factors, including organizational culture, the expertise of the staff as well as the technological support provided (Qiu & Pesch, 2019).

1.1. Research Problem

The graphic design industry then moved on with many opportunities owing to China's growing economy and large population (Scharoun, 2009). This growth was realized with digital designing tools in design practice. Tablet PCs were involved in graphic design activities because the mobility offered by digital design tools was adequate. The availability of the technology instruments defined industrial and merchandise designers in order that they might have innovated to facilitate particularly visualization and conceptualization of design choices (Ranscombe et al., 2019).

The externality was a significant factor in organizational performance and was organizational gird. External factors such as market environment, technology, and industry-related forces impact the planning and operations of organizations (Moorman & Slotegraaf, 1999). Another performance dimension in change processes was organizational readiness, defined using adaptational design tools, depending on people's perception, their supervisor's attitude, organizational culture, and change management plans (Weiner et al., 2008).

Although the diffusion of design tools was studied in various contexts, few studies focused on China's leading graphic design agencies. Existing conceptual models failed to uncover the impact of Chinese cultural, economic, and technological environments on adoption processes and outcomes. Organizational performance, feedback-seeking behaviors, and idea-generation tasks were labeled by moderators, as well as acceptance of technological advancements and changes among employees (Stobbeleir et al., 2011). The variable of organization size was proposed as the control variable regarding performance and relations between person-organization fit, creativity, knowledge acquisition, and job satisfaction (Dawson, 2014).

The Chinese graphic design industry was well placed to take up digital design tools based on the incorporation of Oriental themes into modern trends (Fu & Feng, 2022). Still, factors that explained how culture and profession interacted and influenced

performance were abstract, preventing agencies from leveraging China's graphic design cultural asset in the new media era.

1.2. Research questions

As a series of questions, the present research aims to answer the following research questions that reveal the multifaceted connections between digital design tool use and organizational performance of leading Chinese graphic design agencies. The research questions focus on the impact of perceived characteristics of digital design tools, the level of preparedness within the organization and the external environment on organizational performance, based on theories including the Technology Acceptance Model (Davis, 1989), Diffusion of Innovation Theory (Rogers, 2003) and Componential Theory of Creativity.

Furthermore, the study investigates the moderating role of organizational size and the mediating roles of employee acceptance of change and changes to work processes. These questions are designed in a manner such that no two questions overlap. Still, they help the respondents establish the relationship between the factors and adopting digital tools for organizational outcomes. The research also intends to create and test an accurate model of incorporating these complex factors as the Chinese graphic design industry exists in a different cultural, economic, and technological context. Answering these questions will help to fill the gap in the research on digital tool usage and its impact on organizational outcomes in Chinese graphic design agencies.

RQ1: Are there any positive and significant effects of perceived attributes of digital design tools on organizational performance in top Chinese graphic design agencies?

RQ2: Are there any positive and significant effects of organizational readiness factors on the organizational performances of top Chinese graphic design agencies?

RQ3: Are there any positive and significant effects of external environment influences on the organizational performances of top Chinese graphic design agencies?

RQ4: Does employee acceptance of digital tools mediate between perceived attributes of digital design tools and organizational performances in top Chinese graphic design agencies?

RQ5: Do changes to workflows and processes mediate between perceived attributes of digital design tools and organizational performances in top Chinese graphic design agencies?

RQ6: Does organization size act as a moderator between perceived attributes of digital design tools and organizational performances in top Chinese graphic design agencies?

1.3. Contributions

The findings of this research offered theoretical and practical implications for digital design tool adoption and organizational performance in Chinese graphic design agencies. From a theoretical framework, three fundamental theories were employed to formulate a framework for the analysis of digital tool adoption in creative situations: the Diffusion of Innovations (DOI) theory, the Technology Acceptance Model (TAM), and the

Componential Theory of Creativity (CTC). This integration responded to the relationship between the diffusion of technologies, user acceptance, and creative performance in a professional design context.

The study built on previous theoretical frameworks by including the organizational readiness and environmental context in the technology adoption models. This expansion extended the understanding of how contextual market forces and firm resources impacted the effective adoption of digital design tools (Mikalef & Gupta, 2021). The study was particularly relevant to the following theoretical proposition: DOI theory Within the Chinese context of design agencies, cultural and organizational factors largely shaped innovation adoption (Chen et al., 2022).

Using survey data completed by 432 design professionals in top graphic design firms in China, the study provided the empirical confirmation of a new theoretical model that identified the roles of employee acceptance and workflow changes mediating the link between digital tool use and organizational performance. This model demonstrated how the concept of CTC could work with the other technologies in the acceptance models to contribute towards increased creativity in the new digital economies (Stobbeleir et al., 2011).

The study's findings advanced the theory and practice since relationships between organizational readiness factors and adopting digital tools were distinguished. The study offered practical recommendations for how design agencies might want to maximize the benefits of their digital transitions without sacrificing inspiration (Sebastian & Fomina, 2024). This approach was in tune with the current research focusing on combining tech and traditional creativity in the creative economy (Fleming, 2019).

1.4. Summary

The research employed a structured approach under several sections to answer the research question of how the usage of digital design tools impacts organizational performance in the top Chinese graphic design agencies. This study started by analyzing the literature that explored the antecedents of digital tool use in the creative sector, focusing on the Chinese design context. This review also found a lack of prior studies investigating the relationship between using digital design tools and organizational performance concerning top-tier design agencies.

The theoretical foundation was established by integrating three primary theories: the Diffusion of Innovations (DOI) Theory, the Technology Acceptance Model (TAM), the Componential Theory of Creativity (CTC), and the theory of flow. This integration created a conceptual model for examining digital tool adoption and its effect on organizational performance. The section on the methodology explained the quantitative research method of data gathering through a survey instrument from 432 managers from leading Chinese graphic design agencies.

The study used SEM to test the theoretical model and determine the causal relationships between Digital tool adoption, Organizational readiness, Employee acceptance, and Performance outcomes. The results and analysis of the crucial factors determining the successful application of digital tools and their subsequent effect on organizational performance were presented.

Finally, the study offered some managerial and marketing implications for design agencies, such as improving their digital skills and developing creativity. Moreover, the study provided insights for implementing digital tools in organizations and directions for future research in this relatively new field of digitalization of creative industries. These recommendations helped guide future research in academic circles and the field of Chinese graphic design agencies.

2 Literature review

2.. Introduction to Digital Transformation in Design Industry

In the last few decades, the graphic design industry has evolved from manual, sketch-based operations to digital computer-based operations (Dertouzos & Moses, 2019). This change has defined a new way of designing for design professionals, including using illustrations at the early stages before transforming them into CAD (Computer Aided Design) tools and solutions (Selwyn, 2014). Many specialized digital design applications are available, including vector graphics editors, image manipulation software, and integrated design applications (Maravilhas & Martins, 2018).

As an industry, graphic design has been rapidly developing and propagandizing technology in China, especially in urban areas (Feng & Zhang, 2019). The China Industrial Design Association report showed that China's digital creative industry continued to record healthy market growth, particularly in the design services segment, where growth was evident (Han & Chi, 2020). As the market competition pressures and clients' requirements increase, design agencies in China incorporate more sophisticated digital methods into their projects (Wang et al., 2020).

2.2. Theoretical Foundation

2.2.1. Diffusion of Innovations (DOI) Theory

Rogers' (2003) Diffusion of Innovations (DOI) theory was the general theory that explained how new technologies diffused through social systems. The theory identified five critical attributes of innovations: This literature includes concepts such as relative advantage, compatibility, complexity, trialability, and observability, which determined the adoption rates inside the organizational setting. In the context of design technology, these attributes had the following roles in the success or failure of adoption (MacVaugh & Schiavone, 2010).

DOI analysis of the design technology adoption process provided design process details as creative organizations incorporated the new tools. Organizational studies by Lee (2004) demonstrated that adopting design technologies followed Rogers' (2003) adopter categories: innovators, early adopters, early majority, late majority, and laggards. Lee et al. (2018) revealed that compatibility and relative advantage were the most crucial factors in the technology acceptance model in creative industries.

Previous literature on organizations focused on the communication channels and the social systems that drive the diffusion of technologies (Weiner et al., 2008). Hameed et al.'s (2012) study revealed that industry type, structure, and preparedness affected IT innovation implementation processes in organizational size.

2.2.2. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), as introduced by Davis (1989), became widely recognized as one of the most important theoretical models addressing individual technological adoption behaviors. TAM assumed that perceived usefulness and ease of use were two main factors influencing users' acceptance of information technologies (Venkatesh & Davis, 2000). It was possible to identify these core constructs as crucial for understanding users' attitudes and behavioral intentions towards new technologies.

As the use of the TAM increased, several extensions and modifications were developed to suit different contextual factors. TAM2, refined by Venkatesh and Davis (2000), integrates social influence and cognitive instrumental processes. Eight other models were combined to form the Unified Theory of Acceptance and Use of Technology (UTAUT).

In creative industries, the TAM applications pointed out different trends regarding technology acceptance. Lee et al. (2019) established that perceived creative enhancement capability positively and significantly impacted creative workers' adoption of digital tools. The study by Bhattacharjee and Park (2014) showed that user satisfaction and perceived compatibility were the critical determinants of creative software usage. Mikalef and Gupta (2021) also affirmed the finding by demonstrating that perceived usefulness and actual system use in design contexts are mediated by individual creativity and the fit between tasks and technology.

2.2.3. Componential Theory of Creativity (CTC)

The Componential Theory of Creativity (CTC) formulated by Amabile (1983) introduced an extensive theoretical foundation of creativity within the organizational workspace. The theory identified four essential components: domain-relevant skills, creativity-relevant processes, task motivation, and social context (Amabile & Pratt, 2016). These components were functional and related dynamically to affect creativity in the organizational context.

Organizational creativity factors have the most significant influence on innovation and creative productivity. Shalley and Gilson (2004) found that organizational support, resources, and work environment influenced creative performance. Lee et al. (2019) further confirmed that leadership styles and organizational climate significantly influenced employees' creativity.

Exploring the integration of CTC with technology adoption, several connections between creativity and technology use were established. Oldham and Da Silva (2015) studied the fact that technology support improves creativity when it matches other organizational conditions. Anderson et al. (2014) observed that the supports and affordances of the technologies facilitated creativity and innovation or restricted creativity and innovation depending on the extent to which it matched the creativity of the individuals or organizations.

2.3. Perceived Attributes of Digital Design Tools (PADDT)

The perceived attributes of digital design tools played a significant role in determining the degree of their adoption and integration within the design organizations under consideration. According to Roger's innovation characteristics, these attributes entailed relative advantage, compatibility, complexity, trialability, and observability (Moore & Benbasat, 1991). Lin and Chou (2009) found that perceived usefulness and perceived ease of use were significant factors influencing the use of digital tools by design workers. Rahimi et al. (2016) showed that compatibility with the existing work practices and perceived ease of use or relative advantage did influence the extent to which design software was adopted. The level of sophistication in using the tools created another challenge in implementing the tools, mainly in traditional design organizations (Haber & Carmeli, 2023). Moreover, Christensen (2013) noted how observable the design outcomes are and how easy it is to test new tools to regulate the adoption processes across creative agencies.

2.4. Organizational Readiness Factors (ORF)

Organizational readiness factors captured aspects within an organization that defined its readiness to adopt and implement digital design tools effectively. According to research by Weiner (2009), these factors encompass technological, capital, and organizational support. The role of top management support was identified as one of the vital contingent factors influencing the implementation of technologies in design firms (Oliveira & Martins, 2011).

Snyder-Halpern (2001) established four readiness: technical readiness, organizational culture, and operational readiness. Several research studies by Rafferty et al. (2013) pointed out that challenges in change management capabilities and aspects of employees' skills can significantly influence technology adoption processes. Furthermore, Lokuge et al. (2019) revealed that organizational learning capacity and knowledge management systems were the two critical factors that affected the success of digital transformation in creative organizations.

2.5. External Environment Influences (EEI)

The external environment influences contributed to the changes that affected the organizational decisions to adopt the digital design tool. Tornatzky and Fleischer's (1990) technology-organization-environment showed how decisions affected technology implementation based on environmental context. The most essential factor that reportedly influenced the digital transformation in design agencies was market competition by Kim and Kim (2022).

Studies done by Melville et al. (2004) showed that industry factors and trading partner resources affect IT value creation. In the choice of tools, the main drivers identified in the creative industries were client demands and competition pressure (Snyder-Halpern, 2001). Further, Yoo et al. (2012) revealed that the regulatory environment and technological turbulence were the factors that influenced organizational innovation strategy. The study by Oldham and Da Silva (2015) showed that organizations engaged in digital transformation exercises, and these pressures included coercive, mimetic, and normative.

2.6. Mediating Factors

2.6.1. Employee Acceptance of Digital Tools (EADT)

Employee acceptance was highlighted as an essential moderator in effectively integrating digital design tools in organizations. Based on Davis's (1989) technology acceptance model, Brown et al. (2014) described and measured further determinants of employee acceptance, including perceived usefulness and ease of use in creative work settings.

According to Venkatesh et al. (2016), different factors, including one's attitudes, behavioral intentions, and usage behavior, affect the success of digital tool usage. It was suggested that Kim and Crowston (2011) also identified user satisfaction and perceived compatibility with existing work practices as key factors influencing the use of digital tools in the subsequent continuous manner. Moreover, Agarwal and Prasad (1998) showed that according to the UTAUT model, personal innovativeness and computer self-efficacy positively influenced the employees' intent to use new digital design technologies.

2.6.2. Changes to Workflows and Processes (CWP)

The use of digital design tools required a paradigm shift towards new patterns in working and structures within the sector. According to the study conducted by Davenport (2013), it was clear that BPR was a crucial factor in electronic business strategies. Research showed that the workflow changes greatly affected organizational performance and employee productivity during technology introduction and implementation (Hammer & Champy, 2009).

In the study by Awino (2016), the following critical success factors were enumerated: strategic alignment, governance, and methods. According to Trkman (2010), the continuity of process improvement was identified as an essential aspect due to the ever-evolving technology. Also, Vander Aalst (2013) noted that workflow patterns and process mining techniques facilitated the achievement of positive outcomes in digital business transformation. Vom Brocke et al.'s (2014) paper presented six BPM core competencies that needed to be adapted using digital tools.

2.7. Organization Size (OS) as Moderator

The study also found that organization size moderates the adoption and implementation of digital design tools. Lokuge et al. (2019) showed that while grand firms had more resources to support the use of technology, they encountered more significant technology deployment issues. Alkhamery et al. (2020) found that organizational size has an interactive effect on technology readiness for digital transformation success.

Oliveira and Martins (2011) have stated that the adoptive behavior of large organizations has been observed to differ from that of small firms because of the structural and resource characteristics of the organizations. Ramdani et al. (2013) determined that size played a role in the pace and degree of technology integration within creative businesses. Also, Lee and Xia (2006) pointed out that organization size was a mediator in the role of organizational influences and IT adoption decisions by affecting the implementation breadth and resource commitment.

2.8. Organizational Performance (OP)

Organizational performance was another significant dependent variable examined in digital design tool adoption research. Bharadwaj (2000) found that better IT capabilities resulted in more incredible firm performance in productivity and market value. Melville et al. (2004) employed research to institute correlations between technology deployment and several operation/financial benchmarks.

Kohli and Melville (2018) described that various information characterizations are impacted by digital transformation, such as process efficiency, innovation capability, and competitive advantage. Wade and Hulland's (2004) research showed that integrating technology improved organizational capacities and allowed for sustainable competitive advantages. Further, Mithas et al. (2012) discovered an increase in information management that enhanced the management of customers, processes, and performance. What they were able to show was that firms that had higher levels of IT capability received better returns and had better efficiency.

2.9. Research Gap Identification

Some gaps identified in the literature regarding the research on digital tool adoption include the following. The work of Nambisan et al. (2017) revealed the conceptual ambiguity concerning creativity's flexible industries with a focus on digital transformation. The combination of creativity theories with the technology acceptance model has remained relatively unexplored in prior frameworks (Fichman et al., 2014).

Current limitations were moderate and included inadequate exploration of organizational readiness factors applicable in design firms (Yoo et al., 2012). The study by Liu et al. (2024) revealed the gaps in the research on integrating the organization's culture and technology tools. More research is needed on how employee creativity influences the acceptance of technologies and how digital tools affect creative processes (Seidel et al., 2013).

The development of the model was explained by the fact that different theories have to be incorporated, and some context has to be taken into account in creative industries (Kohli & Melville, 2018). The purpose of this research approach was to fill theoretical gaps that currently exist in the literature and offer actionable knowledge on how organizations might proceed.

2.10. Model development

This research's theoretical framework was formulated by synthesizing existing theories and findings of prior research in digital transformation and organizational performance. The model included three independent variables: perceived attributes of digital design tools, organizational readiness factors, and external environment influence; two mediating variables, employee acceptance and changes to processes; and one moderating variable, organization size, which affects the dependent variable of organizational performance.

The literature review revealed that the perceived characteristics of digital design tools, such as compatibility and observability of a design with existing systems and organizational outputs, respectively, were found to impact organizational performance

positively (Shen et al., 2022). It was also found that organizational readiness factors such as management support and technological competence are important decision variables for triumphant digital transformation (Venkatesh & Davis, 2000).

The model proposed six hypotheses based on existing literature:

H01: There is no positive and significant effect of the perceived attributes of digital design tools on organizational performance in top Chinese graphic design agencies.

H02: There is no positive and significant effect of organizational readiness factors on organizational performance in top Chinese graphic design agencies.

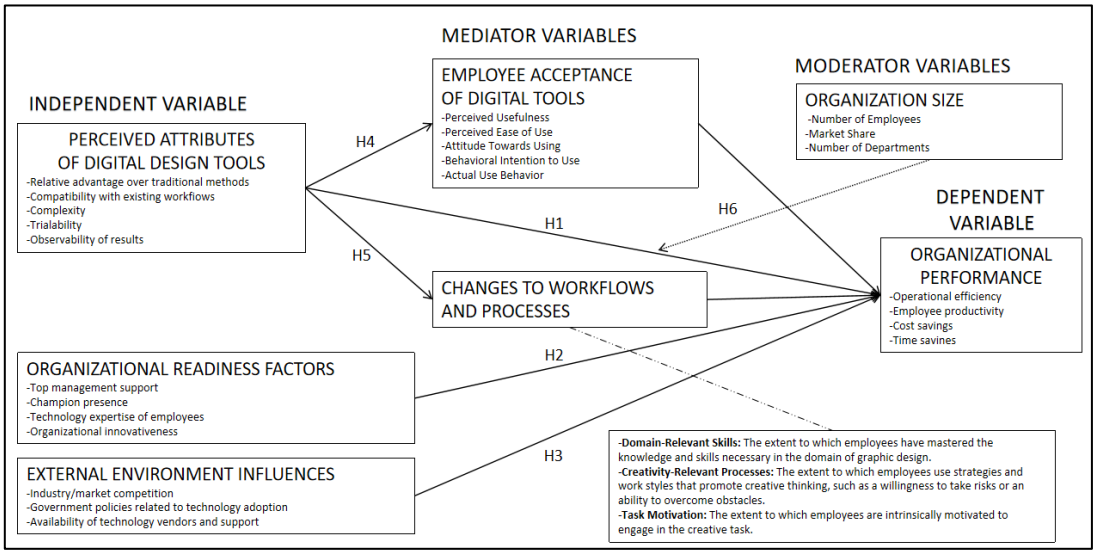
H03: There is no positive and significant effect of external environment influences on organizational performance in top Chinese graphic design agencies.

H04: Employee acceptance of digital tools does not mediate the relationship between the perceived attributes of digital design tools and organizational performance in top Chinese graphic design agencies.

H05: Changes to workflows and processes do not mediate the relationship between the perceived attributes of digital design tools and organizational performance in top Chinese graphic design agencies.

H06: Organization size doesn't moderate the relationship between perceived attributes of digital design tools and organizational performance in top Chinese graphic design agencies.

Figure 1: Theoretical Model Developed for This Study



The theoretical model for this study (Figure 1) was based on the Technology Acceptance Model (TAM) by Davis (1989), the Innovation Diffusion Theory by Rogers (2003), and the Componential Theory of Creativity (CTC) formulated by Amabile (1983); however, studies of organizational factors based on previous research on digital technology and creative industries were also considered. The fact that employee acceptance and changes in workflow were mediators was consistent with findings by DeLone and McLean (2003) on the success factors for technology implementation.

4. Method

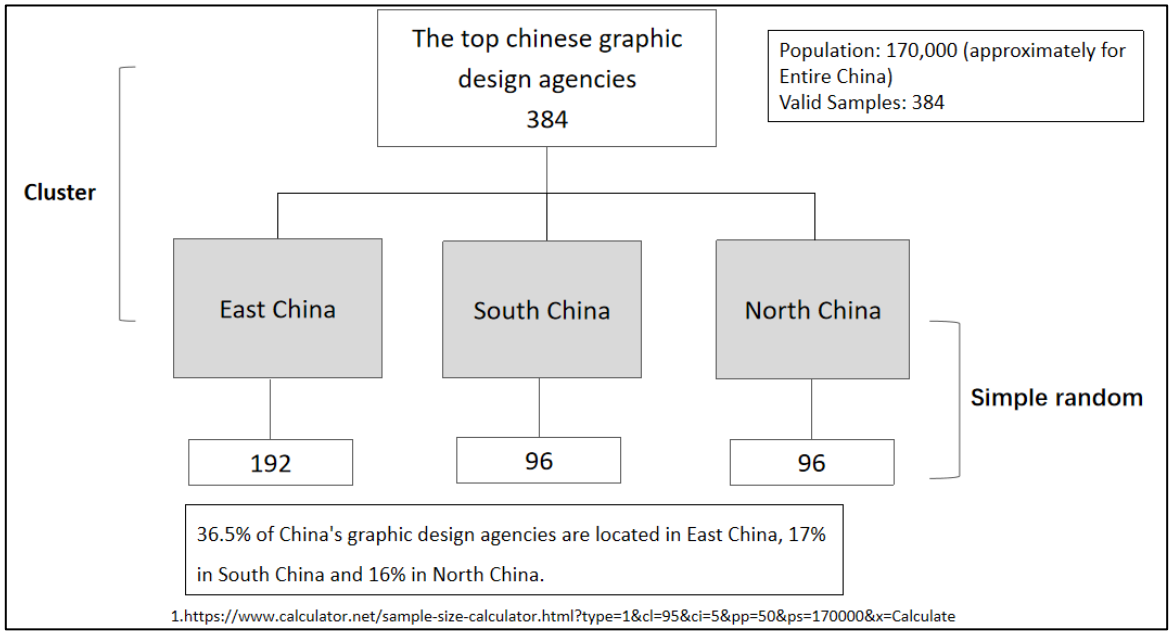
This research used a survey approach to theoretically validate the conceptual model (see Figure 1) of digital design tool adoption in Chinese graphic design agencies. Primary research through surveys is a prominent research approach in the recent literature on technology adoption in creative organizations and its consequences on performance (Liu et al., 2024). This approach was particularly suitable for exploring the associations between digital tools, employees, and organizational consequences from managerial perspectives in design agencies (Frich et al., 2021).

3.1. Sample selection

There were 170,000 graphic design organizations in China (Pavliv & Zeqian, 2024). Members calculated the correct sample size using the sample size calculator and with population elements of 170,000 graphic design agencies in China, a confidence interval of 95%, and a margin of error of 5%. Given these parameters, the sample size calculator suggested 384. This calculated sample size is sufficient for the planned statistical analysis the researchers perform, ensuring enough data was available for drawing meaningful and reliable conclusions.

Figure 2 presents a comprehensive overview of the distribution of top Chinese graphic design agencies across three major geographical regions: Three regions, namely East China, South China, and North China are areas of focus. The valid sample of 384 agencies scattered across four regions according to a cluster sampling technique highlighting regional differences. This systematic breakdown is also valuable for establishing the distribution of creative industry resources across various parts of China.

Figure 2: Sampling and Sampling Method Developed for This Study



The most conspicuous distribution is the highly concentrated agencies in East China, where 192 agencies are located. This accounts for half of the total sample size. This high concentration in the eastern region, which accounts for 36.5% of Chinese graphic design agencies, may be attributed to the region's economic significance, primarily in light of crucial business cities such as Shanghai seeking diverse graphic design services. The

other 96 agencies are almost evenly split between South China and North China, which account for 25% of the sample and 17% and 16% of all graphic design agencies in China.

3.2. Research design

For this study, the data collection instrument was developed in the form of a research survey to measure various constructs based on DOI, TAM, and CTC theories to test the effects of digital design tools on the organizational performance of Chinese graphic design agencies. In the survey, the identification of relationships between tool adoption, employee acceptance, and organizational outcomes incorporated moderating and mediating factors.

The suitable constructs and the associated scales required for hypothesis testing were identified using a questionnaire developed from a literature review. Data was collected on digital tool usage practice, organizational readiness and constraint factors, external environment conditions, and agency performance indicators. The statement rating was done with the help of a five-point Likert scale (1 = strong disagreement; 5 = strong agreement) that meets survey design recommendations (Hair et al., 2019a).

The first instrument was piloted through pre-testing to six academic scholars in digital transformation and design management before conducting a pilot study on twelve design practitioners from the top Chinese graphic design agencies. The pilot testing aimed to: (1) construct validity to evaluate the measurement items to fit the construct; (2) face validity to ensure that the statement is clear and easy to comprehend; (3) eligibility criteria validity to ensure that they are correctly aligned; (4) criterion validity to ensure that the theoretical construct is applicable; and (5) face validity to assess the level of measurement sufficiency (El-Den et al., 2020).

Inclusion criteria were established through screening questions to ensure respondents: The five criteria to select the participants for the survey were: (1) Three or more years of experience with the design industry; (2) Knowledge of the digital design tools; (3) Experience incorporating the digital tools into their work; (4) Worked for an organization with the active digital transformation; (5) Had managerial responsibilities; and (6) Involved in strategic decision making (Nambisan et al., 2017). To address this issue, the organization size was controlled to 10 to 50 employees based on the pilot study results because this is the typical size of a top Chinese design agency (Marion & Fixson, 2021).

3.3. Data collection

This study utilizes an online platform, WJX Form, to collect the research data. This decision is well-justified by several key advantages. First, the geographic reach of the study covers various regions across China, and an online data collection method proves convenient as it eliminates the need for the researchers to travel to each location (Wright, 2005). This approach enables them to gather responses from a geographically dispersed sample efficiently. Additionally, internet-based surveys are more time and cost-efficient than conventional paper-and-pencil-based methods, especially when the study involves many subjects (Wright, 2005). The online platform streamlines data collection, reducing the resources and effort required.

Furthermore, online surveys can enhance the data quality through features like required responses and skip logic. These functionalities can minimize missing data and ensure that respondents only answer the questions most relevant to them (Wright, 2005). Lastly, the online platform makes it easier for researchers to organize and transfer data for analysis, decreasing the risk of errors during data entry (Wright, 2005). Overall, using an online data collection method gives the researchers greater efficiency, data quality, and ease of management, making it a highly suitable choice for this study. Sample Population Data shown in Table 1.

Table 1: Sample Population Data

Items	Key Figures
Target Sample Size	384
Incomplete responses	30
Unusable responses	13
Response validation criteria	Non-meaningful response to objective questions; completion time threshold (minimum 20 minutes); inconsistent responses to reverse-coded items; contradictory responses to identical questions presented at different points in the survey; response patterns indicating insufficient attention
Eligible Responses	432 (sample adequacy tested statistically and exceeded the required threshold of 180), validated through methods outlined by Hair et al. (2019a)
Organization Size Distribution	10-25 employees: 45% 26-50 employees: 35% above 50 employees: 20%
Respondent Positions	All management levels (including design directors, creative managers, project managers, digital transformation leads, operations managers)
Average Years of Experience	4.2 years
Agency Specialization	Digital design: 40 Integrated design services: 35 Brand design: 25%

3.4. Data analysis

To establish the relationships among the constructed using quantitative data, the study used Structural Equation Modeling (SEM), where data was analyzed using SPSS 29.0 and SmartPLS 4.0. SEM was chosen as it accommodates independent and hidden variables in theoretical models of great complexity (Hair et al., 2022). This statistical approach has been applied in previous technology adoption research in creative industries to examine the hypothesized relationship and model fitness. Following Henseler et al.'s (2016) suggestion, the measurement and structural model were examined through partial least squares (PLS) modeling using the SmartPLS 4 version because survey research is commonly not normally distributed and the PLS does not assume normality.

4. Analysis and Results

To wave the analysis, maximum likelihood estimation was used as the extraction method in line with practices in organizational research. To facilitate a straightforward interpretation of the pathways between the latent variables, digital tool attributes, organizational readiness, external influences, and the outcome variable, organizational performance, SEM path diagrams were computed (Yasir et al., 2021). With a better model and for comparative purposes to check the accuracy of the above predictions, one

can advance to the next level: PLS-SEM using SmartPLS. This approach enables the testing of a large number of variables at once, the measured and the latent variables, and is most appropriate for use where: This kind of approach to research quantification allows for the application of consistent and stable research questions with digital technology use and the related organizational factors to different organizational performance.

These include the assessment of the so-called measurement model as well as the assessment of the structural model. For the measurement model, we have the reliability current Composite Reliability(CR) and Cronbach's Alpha. The validity is done by the Average Variance Extracted (AVE) for the Convergent validity and the Fornell-Larcker (1981) criterion or Heterotrait-Monotrait (HTMT) ratio for discriminant validity. The mediating role of the structural model is evaluated in terms of R^2 values, f^2 effect sizes, Q^2 values and path coefficients, t-values, and p-values obtained from bootstrap analyses.

4.1. Correlation Analysis

The present study used correlation analysis to investigate the relationships between the study variables. Pearson correlation coefficients (r) were used to determine the strength and direction of the digital tool adoption factors and the organizational performance measurements (Hair et al., 2022). This analysis enabled an understanding of the possible multicollinearity and checked the a priori theories of the interrelations between the chosen variables. The correlation coefficients were calculated between -1 and 1, with closer values to ±1 implying the most substantial relationship between the variables, while values nearer to 0 indicated a weaker relationship (Moore & Benbasat, 1991).

As shown in Table 2, it was found that all the variables examined were strongly and positively related to one another ($p<0.01$). The highest effects are of the PADDT, with OP having an effect size of 0.314, followed by PADDT with ORF 0.305, and then the ORF with an effect size of 0.300. This means the perception of digital design tools, organizational readiness, and organizational performance are related. All the other correlations are also significant, but they are, at best, moderate to weak, with coefficients ranging from 0.125 to 0.287. Organization Size (OS) tends to reveal the least significant or lower levels of interdependence with other variables. It is established that the positive correlations are significant, which implies that these organizational and technological factors are generally in the same direction.

Table 2: Nonparametric Correlations

Variables	PADDT	ORF	EEI	EADT	CWP	OS	OP
PADDT	1.000						
ORF	0.305**	1.000					
EEI	0.287**	0.214**	1.000	0.135**	0.163**	0.183**	0.256**
EADT	0.290**	0.235**	0.135**	1.000	0.125**	0.176**	0.263**
CWP	0.197**	0.223**	0.163**	0.125**	1.000	0.199**	0.252**
OS	0.159**	0.149**	0.183**	0.176**	0.199**	1.000	0.273**
OP	0.314**	0.300**	0.256**	0.263**	0.252**	0.273**	1.000

Note: **. Correlation is significant at the 0.01 level (1-tailed). Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organization Size (OS); Organizational Performance (OP)

4.2. Full Collinearity Testing

Since the data was collected from a single source, we first checked common method bias by following the direction of Kock and Lynn (2012) and Kock (2017) by checking full collinearity. In this method, all the independent variables will be regressed against the dependent variable, and if that VIF ≤ 3.3, there is no problem of multicollinearity arising out of single source data. The analysis gave VIF less than 3.3; therefore, single-source bias is not a serious concern with our data.

Table 3 presents the results of the Full Collinearity Test for the independent variables: Perceived Attributes of Digital Design Tools (PADDT), Organizational Readiness Factors (ORF), and External Environment Influences (EEI). Multicollinearity is assessed using the Variance Inflation Factor (VIF), in which all three variables have values below the cut-off of 5, as shown below. The PADDT analysis yielded a VIF of 1.259, ORF of 1.188, and EEI of 1.184. Consequently, these results imply that each independent variable has an individual role in the regression model predicting Organizational Performance (OP); the independent variables do not overlap.

Table 3: Full Collinearity Testing

	PADDT	ORF	EEI
VIF	1.259	1.188	1.184

Note: Dependent Variable: OP. Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Organizational Performance (OP)

4.3. Testing Goodness of Data

The reliability analysis was conducted to assess the goodness of the data and determine the construct validity through Exploratory Factor Analysis (EFA). Cronbach's alpha reliability coefficients of all the constructs were obtained, which were all higher than 0.70, showing internal consistency as advised by Nunnally and Bernstein (1994). EFA confirmed high staff density and the other variables as separate factors, indicating that the measurement instruments could capture the theoretical constructs a priori.

Table 4 shows the goodness of data tests such as area of applicability, reliability coefficient, and KMO and Bartlett's Test of Sphericity. Inter-observer reliability of all constructs was very high, and Cronbach's alpha value was calculated at 0.870 to 0.932, which is highly acceptable (Nunnally & Bernstein, 1994). Item sampling adequacy was established at KMO = 0.941, While Bartlett's test of Sphericity was found to have a significance level of χ^2 = 11603.354, df = 1128, p <.001, further signifying that the variables were highly correlated to allow EFA to be carried out. These results showed that the instruments used were appropriate for measuring the constructs of interest.

Table 4: Testing Goodness of Data

variable	Cronbach's Alpha(variable)	Cronbach's Alpha	Kaiser-Meyer-Olkin (KMO)	Bartlett's Test of Sphericity		
				Approx. Chi-Square(χ^2)	df	Sig.
PADDT	0.932	0.941	0.941	11603.354	1128	<.001
ORF	0.903					

EEI	0.883
EADT	0.922
CWP	0.870
OS	0.904
OP	0.907

Note: Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organization Size (OS); Organizational Performance (OP)

4.4. Measurement model

The measurement model's evaluation involved examining three key metrics: factor loadings, AVE, and CR scores. According to Hair et al. (2022), acceptable thresholds are 0.5 or higher for both loadings and AVE, while CR needs to exceed 0.7. Following this, we evaluated the model's discriminant validity by applying the HTMT approach (and later refined by Franke & Sarstedt, 2019; developed by Henseler et al., 2015). For HTMT analysis, researchers can apply either a conservative threshold of 0.85 or a more flexible cutoff point of 0.90. These analyses confirmed the measurement model and laid a sound empirical foundation for further structural model analysis.

The measurement model analysis in Table 5 indicated that all constructs have good psychometric evidence, good internal consistencies, and validities. The composite reliability (CR) value varied from 0.902 to 0.943, thus being higher than the essential standard 0.7 (Hair et al., 2019), suggesting high internal consistency reliability. The PADDT construct, which had the highest CR value of 0.943, especially indicated the high internal consistency of the construct when measuring perceived attributes of digital design tools, as defined by Venkatesh et al. (2016).

Table 5: Measurement Model for the Constructs

	Loadings		AVE	CR
CWP	CWP1	0.775	0.606	0.902
	CWP2	0.750		
	CWP3	0.848		
	CWP4	0.778		
	CWP5	0.745		
	CWP6	0.771		
EADT	EADT1	0.785	0.589	0.935
	EADT2	0.773		
	EADT3	0.766		
	EADT4	0.748		
	EADT5	0.766		
	EADT6	0.717		
	EADT7	0.791		
	EADT8	0.771		
	EADT9	0.803		
	EADT10	0.749		
EEI	EEI1	0.789	0.631	0.911
	EEI2	0.798		
	EEI3	0.729		

	EEI4	0.790		
	EEI5	0.865		
	EEI6	0.789		
	OP1	0.768		
	OP2	0.769		
	OP3	0.782		
OP	OP4	0.767	0.603	0.924
	OP5	0.813		
	OP6	0.768		
	OP7	0.767		
	OP8	0.776		
	ORF1	0.772		
	ORF2	0.730		
	ORF3	0.766		
ORF	ORF4	0.759	0.596	0.922
	ORF5	0.771		
	ORF6	0.764		
	ORF7	0.824		
	ORF8	0.787		
	OS1	0.800		
	OS2	0.819		
	OS3	0.813		
OS	OS4	0.836	0.676	0.926
	OS5	0.844		
	OS6	0.822		
	PADDT1	0.793		
	PADDT2	0.812		
	PADDT3	0.790		
	PADDT4	0.794		
	PADDT5	0.781		
PADDT	PADDT6	0.776	0.623	0.943
	PADDT7	0.808		
	PADDT8	0.778		
	PADDT9	0.777		
	PADDT10	0.783		

Note: Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organization Size (OS); Organizational Performance (OP)

According to Fornell and Larcker (1981), the AVE should be higher than 0.5; in this study, all constructs have an AVE greater than 0.5 but within a range of 0.589 to 0.676. Among the constructs, the Organization Size (OS) had the highest AVE of 0.676, which implies better convergent validity of its measures. This was due to previous recommendations in organizational research on technology transfer (Zhang & Dhaliwal, 2009).

In factor loadings, all the items were above the minimum standard of 0.7 recommended by Anderson and Gerbing (1988), with factor loadings varying between 0.717 and 0.865. The most significant loading was obtained for EEI5=0.865 in the External Environment Influences factor, and the smallest, but still reasonable, was for EADT6=0.717. These

findings accord with current digital transformation research in Asian settings (Liu et al., 2024).

The measurement model mainly yielded high loadings for the indicators of the PADDT construct, with values ranging from 0.776 to 0.812 for ten indicators, implying the availability of a solid measure to evaluate the attributes of digital design tools. Equally, the analysis confirmed the reliability of the EADT construct and its ten items as critical mediators in the proposed conceptual model (Klein et al., 2024).

The Heterotrait-Monotrait Ratio Correlations (HTMT) analysis in Table 6 revealed moderate discriminant validity for all the constructs in the research model. All HTMT values stayed below the conservative cutoff of 0.85 (Henseler et al., 2015), with the maximum ratio of 0.411 established between CWP and OP. In general, the interaction term (OS x PADDT) provided an acceptable to high HTMT value (0.033 to 0.321), suggesting adequate discriminant validity from other latent variables (Hair et al., 2019b). These results echoed prior technology adoption research in organizational settings (Voorhees et al., 2016), supporting that each construct in the research model was distinct.

Table 6: Discriminant Validity (HTMT)

	CWP	EADT	EEI	OP	ORF	OS	PADDT	OS x PADDT
CWP								
EADT	0.258							
EEI	0.280	0.238						
OP	0.411	0.383	0.361					
ORF	0.343	0.334	0.316	0.408				
OS	0.266	0.247	0.226	0.349	0.222			
PADDT	0.329	0.388	0.400	0.409	0.400	0.256		
OS x PADDT	0.201	0.215	0.185	0.033	0.199	0.244	0.321	

Noted: Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organization Size (OS); Organizational Performance (OP)

4.5. Structural model

As shown in Table 7, the findings of direct effect analysis indicated that all the independent variables were significantly related to organizational performance in Chinese graphic design agencies. These were the overall perceived attributes of digital design tools (PADDT) with an effect size of 0.179 ($P < 0.001$), organizational readiness factors (ORF) with an effect size of 0.167 ($P < 0.001$), and external environment influences (EEI) with an effect size of 0.136 ($P = 0.001$). These findings were consistent with knowledge regarding creativity and technology in creative professions (Zhang & Dhaliwal, 2009).

Table 7: Hypothesis Testing Direct Effects

	Relationship	Std Beta	Std Error	T values	P values	5%	95%	f^2	VIF	Decision
H01	PADDT->OP	0.179	0.048	3.700	0.000	0.096	0.255	0.035	1.450	Rejected
H02	ORF -> OP	0.167	0.044	3.795	0.000	0.097	0.240	0.035	1.284	Rejected

H03	EEI -> OP	0.136	0.042	3.275	0.001	0.070	0.205	0.024	1.218 Rejected

Note: Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Organizational Performance (OP)

Most of the Variance Inflation Factor (VIF) values for relationships were still below this threshold, ranging from 1.218 to 1.450; therefore, there were no significant multicollinearity concerns. The effect sizes (f^2) ranged from 0.024 to 0.035, which can be considered small but significant by following Cohen's measurement (Chin et al., 2008; Cohen, 1988). Moreover, the confidence intervals (CI) did not contain the value of zero, which also testified to the meaningfulness of these connections. All of the above results led to the rejection of all three null hypotheses and the confirmation of the three alternative hypotheses on the positive impact of PADDT, ORF, and EEI on organizational performance.

As shown in Table 8, the indirect effects exposed the mediation and moderation of overarching relationships in the research model. The mediated path through Employee Acceptance of Digital Tools was significant, presenting significant relationships as follows: PADDT and EADT had a significant positive relationship ($\beta = 0.368$, $p < 0.001$), as did EADT and OP ($\beta = 0.176$, $p < 0.001$). These results were consistent with the technology adoption literature reviewed earlier, for instance, by Venkatesh et al. (2016). The mediating effect of Changes to Workflows and Processes (CWP) was also established, meaning that the path from PADDT to CWP was significant ($\beta = 0.301$, $p < 0.001$), as was the path from CWP to OP ($\beta = 0.192$, $p < 0.001$). This aligned with previous studies done on digital transformation processes in design organizations.

Table 8: Hypothesis Testing Indirect Effects

		Relationship	Std Beta	Std Error	T values	P values	5%	95%	Decision
H04	H04a	PADDT>EADT	0.368	0.046	7.934	0.000	0.292	0.445	Rejected
	H04b	EADT -> OP	0.176	0.042	4.197	0.000	0.106	0.244	Rejected
H05	H05a	PADDT->CWP	0.301	0.052	5.787	0.000	0.216	0.387	Rejected
	H05b	CWP -> OP	0.192	0.042	4.524	0.000	0.120	0.260	Rejected
H06		OS x PADDT -> OP	0.202	0.035	5.707	0.000	0.145	0.261	Rejected

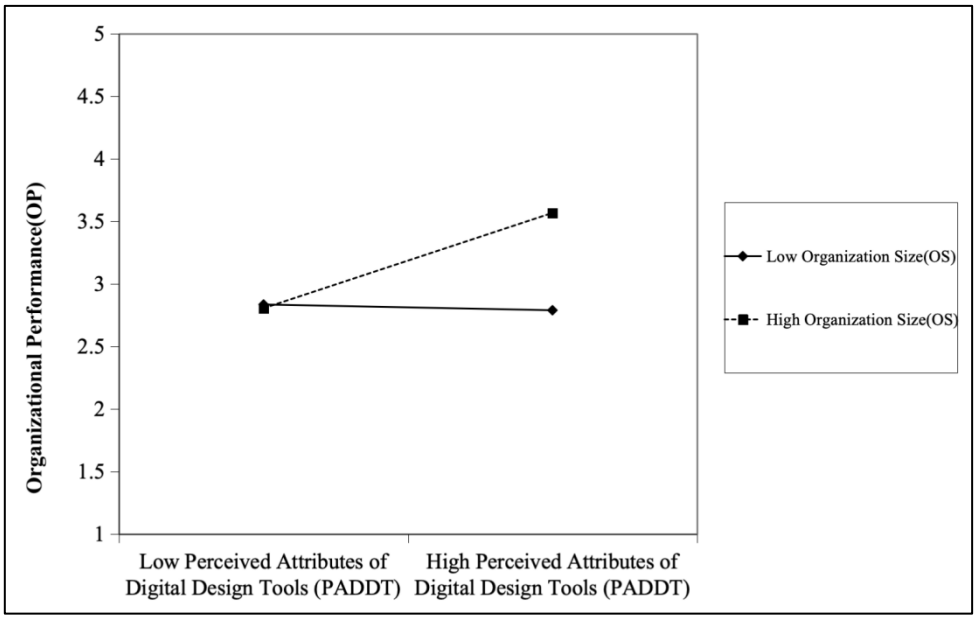
Note: Perceived Attributes of Digital Design Tools (PADDT); Organizational readiness factors (ORF); External environment influences (EEI); Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organization Size (OS); Organizational Performance (OP)

The negative moderation effect of Organization Size (OS) on the impact of PADDT on OP was also established ($\beta = 0.202$, $t < 0.001$), pointing to the fact that organizational size enhanced the connection between digital design tools and performance. This finding aligned with the literature on technology adoption in creative industries (Lee & Xia, 2006). Again, all the confidence intervals were above zero, thus confirming the rejection of null hypotheses H04, H05, and H06.

For mediating effect analysis in Figure 3, slope analysis was applied to the relationship between Organization Size (OS) as the moderator variable, Perceived Attributes of Digital Design Tools (PADDT) as the independent variable, and Organizational Performance (OP) as the dependent variable. The graph shows that organization size

moderated the positive relationship between PADDT and OP; the positive slope was higher for high OS than for low OS, supporting the hypothesis (Baron & Kenny, 1986).

Figure 3: Moderating graph of OS between PADDT and OP



Comparing organizations with high OS and low OS, the result revealed that high OS organizations have a positive significant relationship between PADDT and OP more than low OS organizations; this meant that large organizations were in a better place to utilize digital design tools for better performance fully. This supported prior studies showing that greater company size was, in general, accompanied by more resources and capabilities to support the deployment of and derive value from digital tools (Sebastian & Fomina, 2024). On the other hand, organizations with low OS have a less positive relation, suggesting that small organizations might have more issues in leveraging the full potential of digital design tools, possibly because of a lack of resources.

The PLS Predict analysis confirmed the high predictive capability of the research model through several criteria. The Q^2predict values were positive throughout all the measures, between 0.042 and 0.177 in Table 9, which evidences that the model had satisfactory levels of predictive relevance (Shmueli et al., 2019). The extreme values of Q^2predict ranged from 0.157 to 0.177, reaching Organizational Performance (OP) indicators, proving that this important dependent variable has exceptionally high levels of predictability.

The results of the comparison between PLS-SEM and Linear Model (LM) RMSE values reflected predominantly negative differences, the range being -0.056 to 0.031. Such results were within the rules set by Shmueli and her colleagues, as well as Hair and his co-authors (Hair et al., 2020; Shmueli et al., 2016), meaning that the PLS-SEM model seemed to have high predictive accuracy, as the prediction errors are lower than the errors of the linear model used as a benchmark. The calculated RMSE amounted to values below 1.2 when considering PLS-SEM and LM, which indicates good model fit and the models' predictive accuracy for all measured variables.

Table 9: PLS Predict MV Summary

	Q^2predict	PLS-SEM_RMSE	LM_RMSE	(PLS-SEM_RMSE) - (LM_RMSE)
CWP1	0.054	0.968	0.988	-0.020
CWP2	0.055	0.913	0.909	0.004
CWP1	0.042	1.149	1.166	-0.017
CWP2	0.053	1.001	1.021	-0.020
CWP1	0.056	0.958	0.975	-0.017
CWP2	0.045	0.987	0.956	0.031
EADT1	0.107	0.981	1.007	-0.026
EADT2	0.103	0.946	0.960	-0.014
EADT1	0.052	0.959	1.005	-0.046
EADT2	0.062	1.002	1.036	-0.034
EADT1	0.053	0.990	1.014	-0.024
EADT2	0.064	0.963	0.972	-0.009
EADT1	0.086	0.990	1.013	-0.023
EADT2	0.082	0.976	0.994	-0.018
EADT1	0.059	1.139	1.168	-0.029
EADT2	0.072	0.982	1.014	-0.032
OP1	0.157	0.940	0.988	-0.048
OP2	0.173	0.910	0.949	-0.039
OP1	0.170	0.906	0.951	-0.045
OP2	0.162	0.949	1.001	-0.052
OP1	0.173	1.100	1.156	-0.056
OP2	0.177	0.910	0.955	-0.045
OP1	0.175	0.914	0.960	-0.046
OP2	0.166	0.904	0.953	-0.049

Note: Employee Acceptance of Digital Tools (EADT); Changes to Workflows and Processes (CWP); Organizational Performance (OP)

5. Discussion

The focus is on the proposed model for estimating organizational performance using the extent of digital design tool adoption in the top Chinese graphic design agencies. The usage of Perceived Attributes of Digital Design Tools (PADDT), Organizational Readiness Factors (ORF), and External Environment Influences (EEI) as variables confirms that adopting the digital instruments is not a binary process but takes into account multiple factors affecting the organization's performance. The idea presented in this model concerns the interdependence of such factors and their impact on the acceptance of digital design tools and their proper functioning.

The research also shows that Employee Acceptance of Digital Tools (EADT) and Changes to Workflows and Processes (CWP) are the moderating variables that link the independent variables specified above to Organizational Performance (OP). Earlier studies pointed to the fact that to achieve technology acceptance, it is necessary to have the right capabilities of the tools as well as the organizational predisposition to the change process. This conclusion reveals the importance of creating organizational enablers for innovation and flexibility, which are in harmony with the assumptions of the Technology Acceptance Model (TAM).

Moreover, the analysis of Organisation Size (OS) as the moderating variable indicates that the conditions under which the digital design tools are implemented may be quite different for large organizations compared to small ones. Some of the earlier works of literature reveal that while large firms are generally endowed with some resources for implementing new technologies, at the same time, they may also be subjected to

bureaucratic inertia that may act as a barrier to technological change (Chen & Kim, 2023). This relationship balances scope economies and liability to resistors, necessitating the need to formulate unique strategies for large and small organizations.
DOI Theory, TAM, and CTC are the theoretical models that can explain the relationships between the variables proposed in this study. While the DOI theory puts much importance on perceived attributes in adoption, TAM is concerned with perceived ease in using technology and the perceived usefulness of the technology (Davis, 1989; Rogers, 2003). The inclusion of CTC brings into the model the concept of creativity in using technology to drive performance.

Therefore, this research fills the gap in the literature by presenting an integrated model of the interdependencies between various aspects that play a role in organizational performance in the context of digital design tools. The results imply that graphic design agencies should pay special attention to employee acceptance, change, and organizational readiness to leverage the potential of digital advances.

6. Conclusion

Analyzing the factors for predicting organizational performance through the adoption of digital design tools is valuable to understanding the graphic design agencies of China. The interconnection between the independent variables, namely Perceived Attributes of Digital Design Tools (PADDT), Organizational Readiness Factors (ORF), External Environment Influences (EEI), and Organizational Performance (OP), is defined in this study. The findings yield several critical outcomes: First, EADT and CWP act as moderating variables between the various independent variables and OP. Second, OS is posited to moderate the relationships within the model and shows that organization size influences the adoption relationships. Moreover, the combination of the Diffusion of Innovations (DOI) Theory, the Technology Acceptance Model (TAM), and the Componential Theory of Creativity (CTC) form a robust theoretical framework for explaining such interactions. The knowledge gained from these insights provides prescriptive approaches that can be used by organizations intending to increase the efficiencies of design through the use of digital design tools. Through the above key determinants, stakeholders are in a position to enhance employee acceptance and organizational readiness for innovation and growth in the graphic design business.

6.1. Theoretical Implications and Practical Contribution

The present study provides some theoretical implications for understanding the connections between awareness of digital design tools, organizational readiness, and performance within the environment of the top Chinese graphic design agencies. First, this research is one of the first attempts to explore the relationship between Perceived Attributes of Digital Design Tools (PADDT), Organizational Readiness Factors (ORF), External Environment Influences (EEI), and Organizational Performance (OP). Previous works have investigated multiple technological deployments, but no previous work has done so within the context of graphic design agencies in China while connecting such constructs.

Secondly, the research sets up the moderation roles of Employee Acceptance of Digital Tools (EADT) and Changes to Workflows and Processes (CWP) in the relationship between the independent variables and OP. This aspect accentuates the need to consider employees' attitudes and the overall organizational context when using technologies.

Incorporating these mediators contributes to richness in the current Technology Acceptance literature. It situates itself parallel with the TAM model but does not confine the technology acceptance model to traditional settings.

Third, the research seeks to advance knowledge by considering Organization Size (OS) as a moderating factor in the adoption process. It implies that issues and opportunities that small organizations face and encounter may differ from what large organizations face and encounter, a dimension that previous studies have neglected. In creating these relationships, this study presents a literature review framework that future researchers can use to examine related phenomena in other settings.

In practical terms, the study provides a clear road map that graphic design agencies can implement to improve their performance by integrating more digital tools into their work. From the identified factors, especially EADT and CWP, there is a need to promote acceptance of technology within the employee to enhance its use. Organizations should undertake training interventions that encourage their workforce to engage with and recognize the online technology tools more likely to be implemented. Moreover, the strategies adopted must depend on the organization's size, the availability of resources, and possible bureaucratic obstacles. With this guidance, organizations will know how to use digital design tools better to enhance performance.

6.2. Limitations and Future Directions

However, several weaknesses associated with this research study should be worth noting by future researchers. First, the study targeted only the Graphic design agencies in China and within a limited geographical reach. The generalization of the results is further limited by a small sample size that does not allow for exploring the given phenomenon in different settings or countries. The following research should focus on the increased representation of organizations in the sample and increase the sample size to improve external validity.

Second, because most of the studies have been done in the context of graphic design agencies, the results point to the need for future investigations comparing the research results at different levels of education or in different sectors. For example, by comparing the results of one industry type or level of education to another (e.g., vocational schools versus universities), the researchers can identify differences in the usage and effects of digital design tools (Chen & Kim, 2023).

The research about the use of digital tools may not have effectively captured third, social, ethical, and economic factors. Subsequent studies should consider these elements, as they might help define the operational organizational culture about using the technology in question. Perhaps expanding the study to investigate how organizational culture and leadership either support or undermine the adoption process could give more information.

Finally, due to the changes in graphic design tools, which are summed up in the present paper, further studies should track the progress of new tendencies in the field. Thus, this will longitudinally provide findings and be applicable in determining the organizational needs when managing the digital transformation process.

Ethics Approval and Consent to Participate

The researchers adhered to the ethical guidelines provided by the Research Ethics Committee of Universiti Teknologi MARA (UITM). All procedures conducted in this study involving human participants complied with the ethical standards of the institutional research committee. Informed consent was obtained from all participants in accordance with the Declaration of Helsinki.

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Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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