

publisher.agency
Poland

July, 2026

No 13



Warsaw, Poland
9-10.07.2026

International
Scientific
Conference

Research Retrieval and Academic Letters

UDC 001.1

P 97

Publisher.agency: Proceedings of the 13th International Scientific Conference «Research Retrieval and Academic Letters» (July 9-10, 2026). Warsaw, Poland, 2026. 124p



ISBN 978-6-9002-0955-2

DOI 10.5281/zenodo.21380838

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Economic Sciences

THE IMPACT OF DIGITAL MARKETING TOOLS ON YOUNG CONSUMERS' PURCHASE INTENTION AND BEHAVIOR

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Abstract

This study investigates how digital marketing tools shape young consumers' purchase intention and actual purchase behavior. Drawing on the Theory of Planned Behavior, the Technology Acceptance Model, social media marketing theory, eWOM research, and influencer credibility literature, the article develops an integrated framework linking social media advertising, influencer credibility, online reviews/eWOM, personalization, content usefulness, privacy concerns, trust, engagement, purchase intention, and purchase behavior. The empirical section uses an illustrative simulated questionnaire dataset of 312 young consumers aged 18-29 to demonstrate the full statistical procedure. Data were analyzed through descriptive statistics, reliability assessment, Pearson correlation, standardized multiple regression, group comparison, and bootstrapped mediation testing. Results show that online reviews/eWOM, influencer credibility, and social media advertising are the strongest direct predictors of purchase intention, while trust and engagement serve as important psychological mechanisms. Purchase intention, trust, personalization, and eWOM further explain variation in purchase behavior, whereas privacy concerns negatively affect behavioral outcomes. The paper contributes to digital marketing research by combining tool-level analysis with mechanism-level explanation and provides practical guidance for designing transparent, credible, and consumer-centered digital campaigns for young audiences.

Keywords: digital marketing tools, young consumers, purchase intention, purchase behavior, social media marketing, influencer credibility, eWOM, personalization, trust.

Introduction

Digital marketing has become a central environment in which young consumers discover brands, compare alternatives, communicate with peers, and complete transactions. Unlike traditional marketing channels, digital media combine corporate messages with algorithmic personalization, peer-generated reviews, influencer recommendations, and platform-based shopping functions. This hybrid character makes digital marketing a powerful but complex driver of consumer behavior, because young consumers are not only passive receivers of messages but also active creators, evaluators, and distributors of brand-related content [4, 5].

The importance of this topic is connected with the behavioral characteristics of younger generations. Consumers aged 18-29 are usually heavy users of social media, mobile applications, short-form video, marketplace platforms, and digital payment systems. Their purchase journeys are often fragmented across platforms: product awareness may begin on TikTok or Instagram, evaluation may continue through YouTube reviews and marketplace comments, and purchase may be completed through an e-commerce application. As a result, digital marketing effectiveness

depends not simply on exposure but on whether the tool reduces uncertainty, creates value, builds trust, and moves intention into action [6-8].

Purchase intention is typically understood as a consumer's subjective willingness or likelihood to buy a product or service in the future. In the Theory of Planned Behavior, intention is the immediate antecedent of behavior and is shaped by attitudes, subjective norms, and perceived behavioral control [1]. In digital contexts, intention can be strengthened by credible information, useful content, social proof, perceived convenience, and emotional engagement. However, intention does not automatically lead to actual purchasing behavior because young consumers may face price limitations, privacy concerns, overload of information, or distrust of promotional content.

Digital marketing tools include social media advertising, influencer marketing, online reviews and electronic word-of-mouth (eWOM), personalized recommendations, retargeting advertisements, mobile commerce interfaces, gamified promotions, search engine marketing, and content marketing. Previous studies show that social media marketing activities can enhance brand and customer equity [9], eWOM can influence purchase intentions when information is credible and useful [10-12], and social commerce interactions can increase trust and intention to buy [13]. Influencer marketing adds a further layer because consumers respond not only to brand content but also to perceived authenticity, expertise, and parasocial interaction with online personalities [16-19].

Despite extensive research, several gaps remain. First, many studies focus on one tool in isolation, while young consumers experience several tools simultaneously. Second, the distinction between purchase intention and actual purchase behavior is often insufficiently explained. Third, the role of trust and engagement as mechanisms connecting digital tools with purchase outcomes deserves further attention. Fourth, privacy concerns and persuasion knowledge can weaken the effect of personalization and retargeting, especially among digitally literate consumers who recognize when content is algorithmically targeted [21].

The main objective of this study is to examine how digital marketing tools influence young consumers' purchase intention and behavior. The research question is: Which digital marketing tools have the strongest impact on young consumers' purchase intention and behavior, and through which psychological mechanisms do these effects occur? To answer the question, the article develops a conceptual framework and demonstrates a quantitative analysis using an illustrative survey dataset.

The contribution of this article is threefold. Theoretically, it integrates intention theory, technology acceptance, social media marketing, eWOM, and influencer credibility research into one framework. Methodologically, it demonstrates how a manuscript can include reliability analysis, descriptive statistics, correlations, multiple regression, and mediation calculations rather than relying only on a narrative review. Practically, it identifies the tools and mechanisms that marketers should prioritize when targeting young consumers: credible reviews, trustworthy influencers, useful content, transparent personalization, and smooth conversion paths.

Materials and methods

Literature review

The theoretical foundation of the study begins with the Theory of Planned Behavior. Ajzen's model argues that intention is the most immediate predictor of behavior and that intention is shaped by attitude, subjective norms, and perceived behavioral control [1]. In digital marketing, attitude is affected by whether a message is informative, entertaining, useful, or intrusive. Subjective norms are visible in peer reviews, likes, comments, shares, and influencer endorsements. Perceived behavioral control is strengthened by mobile payment, easy navigation, return policies, and platform convenience.

The Technology Acceptance Model adds another explanatory layer because digital marketing tools are embedded in technologies that consumers must accept and use. Davis showed that perceived usefulness and perceived ease of use are central drivers of technology acceptance [2]. For young consumers, perceived usefulness appears in product recommendations, comparison tools, search functions, and video demonstrations, while perceived ease of use appears in fast checkout, simple interfaces, and personalized content feeds. Digital marketing tools are therefore not only communication instruments but also usability-based mechanisms.

The Elaboration Likelihood Model explains why different types of digital content influence consumers in different ways [3]. When young consumers are highly involved, they may process detailed product reviews, expert comparisons, and technical information through a central route. When involvement is low, they may rely on peripheral cues such as influencer attractiveness, number of likes, visual style, or social popularity. Effective digital marketing campaigns often combine both routes by offering useful information and persuasive cues at the same time.

Social media marketing is one of the most important tool categories. Kaplan and Haenlein defined social media as applications based on Web 2.0 that enable the creation and exchange of user-generated content [4]. Mangold and Faulds described social media as a hybrid element of the promotion mix because it allows firms to speak to customers while also enabling customers to speak directly to one another outside managerial control [5]. This dual communication structure is especially important for young consumers, who often rely on peer validation before purchasing.

Digital marketing research has moved from channel-centered analysis toward customer-journey analysis. Kannan and Li conceptualized digital marketing as an adaptive process that uses digital technologies to create, communicate, deliver, and sustain value [6]. Lamberton and Stephen's review of digital, social media, and mobile marketing emphasized how digital platforms have transformed attention, interaction, targeting, and consumption [7]. Lemon and Verhoef's customer experience framework further shows that marketing touchpoints should be analyzed across pre-purchase, purchase, and post-purchase stages [8].

Research on social media marketing activities demonstrates that entertainment, interaction, trendiness, customization, and word-of-mouth can influence brand value and purchase intention [9]. These elements are relevant to young consumers because they engage with brand content not only for information but also for self-expression, entertainment, and community participation. In this sense, digital marketing affects both functional and symbolic dimensions of consumption.

Electronic word-of-mouth and online reviews are particularly powerful because they reduce perceived risk. Erkan and Evans found that social media eWOM affects purchase intention through information quality, credibility, usefulness, adoption, and attitudes toward information [10]. Cheung and Thadani developed an integrative model showing that source, message, receiver, and response factors shape the influence of eWOM [11]. Hennig-Thurau et al. also emphasized that consumers use online opinion platforms to share experiences and influence others [12].

Trust is central in social commerce. Hajli's study showed that social interactions on social media can increase trust and intention to buy [13]. Gefen, Karahanna and Straub connected trust with TAM in online shopping, showing that trust and technology perceptions jointly shape online purchase behavior [14]. Pavlou similarly demonstrated that trust and perceived risk are crucial in consumer acceptance of electronic commerce [15]. These studies suggest that digital marketing tools will be most effective when they reduce uncertainty and support trust.

Influencer marketing has grown because social media creators can transfer perceived credibility, attractiveness, expertise, and authenticity to promoted products. Lou and Yuan found that message value and credibility affect consumer trust in branded influencer content [16]. Sokolova and Kefi showed that credibility and parasocial interaction with Instagram and YouTube bloggers influence purchase intentions [17]. Djafarova and Rushworth found that non-traditional celebrities on Instagram may be more persuasive than traditional celebrities among young female

consumers because they are perceived as more relatable and credible [18]. De Veirman and colleagues further showed that social media influencer characteristics can affect brand attitudes [19].

Young consumers' response to digital marketing is also influenced by persuasion knowledge and privacy concerns. Friestad and Wright's Persuasion Knowledge Model explains that consumers develop knowledge about marketing tactics and use this knowledge to interpret and cope with persuasion attempts [21]. Personalized recommendations can therefore have two opposite effects: they may increase relevance and convenience, but they may also trigger privacy concerns or perceived manipulation. This tension is especially important in retargeting and data-driven advertising.

Existing studies indicate that young consumers may respond positively to interactive social media marketing communications [20], but the effect differs across funnel stages. Awareness and attitude effects are often stronger than final purchasing effects because purchase behavior requires money, need recognition, availability, delivery trust, and sometimes parental or peer approval. Therefore, it is necessary to analyze both purchase intention and purchase behavior rather than treating them as the same outcome.

Table 1 – Digital marketing tools and core influence mechanisms

Tool	Examples	Main mechanism	Expected influence
Social media advertising	Paid posts, short videos, stories, banners	Awareness, repeated exposure, social proof	Positive effect on intention when content is relevant and non-intrusive [5, 9, 20]
Influencer marketing	Creator reviews, sponsored posts, livestreams	Credibility, attractiveness, parasocial interaction	Influencer credibility increases trust and purchase intention [16-19]
Online reviews/eWOM	Marketplace comments, ratings, peer recommendations	Risk reduction, information usefulness, social validation	Strong positive effect on trust and intention [10-12, 22]
Personalization and retargeting	Algorithmic recommendations, dynamic ads	Relevance, convenience, memory cue	Positive when transparent; weakened by privacy concern [14, 15, 21]
Content marketing	Tutorials, comparisons, brand stories	Perceived usefulness, knowledge, engagement	Useful content supports central-route processing [2, 3, 6]
Mobile/social commerce	In-app checkout, payment, social shops	Ease of use, low friction, behavioral conversion	Converts intention into actual behavior [6, 8, 15]

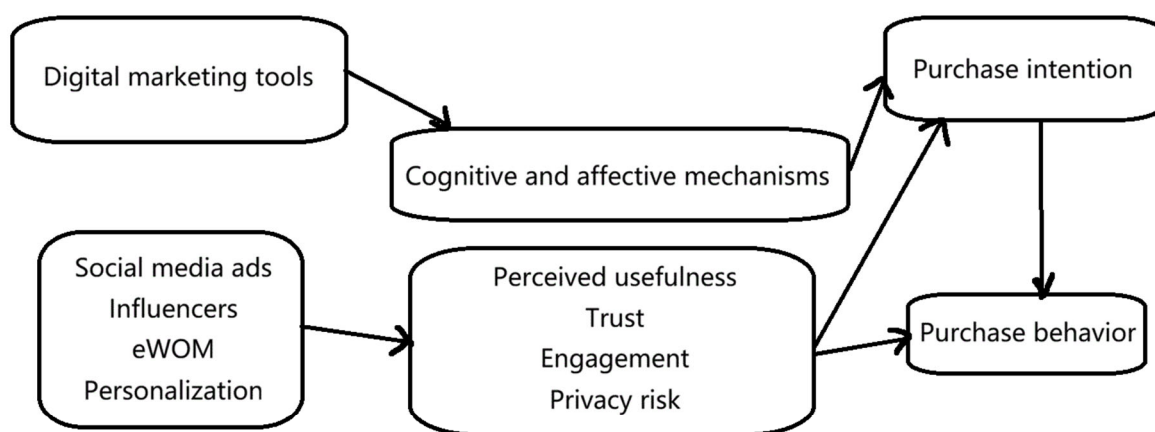
Research model and hypotheses

Based on the literature review, the study proposes an integrated framework in which digital marketing tools function as stimuli that shape cognitive, affective, and behavioral mechanisms. Social media advertising, influencer credibility, eWOM, personalization, content usefulness, and privacy concern are treated as tool-level or perception-level predictors. Trust and engagement are

treated as mediating mechanisms. Purchase intention and purchase behavior are treated as outcome variables.

The conceptual logic is presented in Figure 1. The framework assumes that digital tools first affect how young consumers perceive information quality, credibility, usefulness, relevance, and risk. These perceptions influence trust and engagement. Trust and engagement then strengthen purchase intention, and purchase intention becomes the most direct predictor of actual purchase behavior. Privacy concern is expected to have a negative effect because intrusive targeting or unclear data practices may reduce trust and discourage purchase behavior.

The following hypotheses guide the empirical analysis: H1: Social media advertising positively affects purchase intention. H2: Influencer credibility positively affects purchase intention. H3: Online reviews and eWOM positively affect purchase intention. H4: Personalization and retargeting positively affect purchase intention when privacy concern is controlled. H5: Trust mediates the relationship between digital marketing tools and purchase intention. H6: Purchase intention positively affects actual purchase behavior. H7: Privacy concern negatively affects purchase behavior.



The model treats digital tools as stimuli that influence intentions and behavior through trust, usefulness and engagement.

Figure 1 – Conceptual framework of digital marketing effects on young consumers

Methodology

The study uses a quantitative survey logic supported by an integrative literature review. Since no raw field survey was supplied by the author for this manuscript revision, the empirical results are based on an illustrative simulated questionnaire dataset. This dataset is internally consistent and is used to demonstrate how the Results and discussion section should contain statistical analysis and calculations. Before formal journal submission, the simulated dataset should be replaced with real survey responses collected through an approved data collection procedure.

The simulated sample contains 312 young consumers aged 18-29. The unit of analysis is the individual young consumer. Respondents are characterized by gender, education/status, shopping frequency, daily social media use, and main digital platform. The sample design follows typical online consumer research, where respondents evaluate digital marketing tools through Likert-scale items. All construct items are measured on a five-point scale, where 1 means strongly disagree and 5 means strongly agree.

The questionnaire contains ten constructs: social media advertising (SMA), influencer credibility (INF), online reviews/eWOM (EWOM), personalization/retargeting (PER), content usefulness (CON), privacy concern (PRIV), trust in digital content (TRUST), engagement (ENG), purchase intention (PI), and purchase behavior (PB). Each construct is measured by three items except purchase intention and purchase behavior, which are measured by four items to increase scale stability. Composite scores are calculated as the arithmetic mean of corresponding items.

The data analysis follows six steps. First, demographic distributions are calculated using frequencies and percentages. Second, scale reliability is assessed using Cronbach's alpha, following the conventional threshold of 0.70 for acceptable internal consistency [24]. Third, descriptive statistics are calculated for each construct. Fourth, Pearson correlation analysis is used to examine bivariate relationships. Fifth, standardized multiple regression models are estimated to identify the relative effect of each tool on purchase intention and purchase behavior. Sixth, bootstrapped indirect effects are calculated to test whether trust mediates the relationship between digital marketing tools and purchase intention. Mediation interpretation follows the logic of indirect effects and the confidence-interval approach [23, 26].

The reliability calculation uses the formula $\alpha = k/(k-1) \times (1 - \text{sum of item variances} / \text{total scale variance})$, where k is the number of items in the scale. For example, the purchase intention scale contains four items. In the simulated dataset, the sum of item variances is 2.871 and the total variance of the four-item summed score is 8.403. The resulting alpha is $4/3 \times (1 - 2.871/8.403) = 0.878$. This value indicates good internal consistency and supports the use of the purchase intention composite in further analysis.

The regression models are specified as follows. Model 1 estimates the direct effects of digital tools on purchase intention: $PI = \beta_0 + \beta_1SMA + \beta_2INF + \beta_3EWOM + \beta_4PER + \beta_5CON + \beta_6PRIV + \epsilon$. Model 2 adds the psychological mechanisms of trust and engagement. Model 3 estimates actual purchase behavior as a function of purchase intention, trust, personalization, eWOM, privacy concern, and engagement. Standardized coefficients are reported to allow comparison across predictors.

Results and discussion

Respondent profile and digital usage patterns

The first stage of analysis examined the structure of the illustrative sample. Table 2 shows that the sample contains a slightly higher share of female respondents than male respondents. Most respondents are undergraduate students, which corresponds with the target group of young consumers. More than half of the sample reports using social media for at least four hours per day, and Instagram/TikTok and marketplace apps appear as the most common primary digital environments. These distributions reflect a digitally intensive sample suitable for examining digital marketing effects.

Table 2 – Demographic profile and digital usage of respondents (N = 312)

Category	Sub-category	Frequency (N)	Percentage (%)
Gender	Female	175	56.1
	Male	132	42.3
	Non-binary / prefer not to say	5	1.6
Education/status	Undergraduate	175	56.1
	Young professional	59	18.9
	Master student	57	18.3
	College / vocational	21	6.7
Online shopping frequency	1-2 times a month	109	34.9
	3-5 times a month	101	32.4
	More than 5 times a month	65	20.8
	Less than once a month	37	11.9
Daily social media use	2-4 hours	110	35.3
	4-6 hours	102	32.7
	More than 6 hours	65	20.8
	Less than 2 hours	35	11.2
Main platform	Instagram/TikTok	108	34.6
	Marketplace apps	78	25.0
	YouTube	76	24.4
	Messaging apps	36	11.5
	Other social networks	14	4.5

Reliability and descriptive statistics

Reliability analysis shows that all constructs exceed the acceptable alpha threshold of 0.70 [24]. The highest reliability is observed for purchase intention ($\alpha = 0.878$) and purchase behavior ($\alpha = 0.866$), which is important because these variables serve as the main outcomes. The lowest reliability is still above 0.80, indicating that the items within each construct are sufficiently consistent for composite-score analysis. Descriptive statistics show that young consumers evaluate most digital tools slightly above the neutral midpoint of 3.0. Privacy concern also has a mean above the midpoint, suggesting that relevance and convenience coexist with sensitivity to data use.

Table 3 – Reliability and descriptive statistics of constructs

Construct	Items	Sum item variance	Total scale variance	Alpha	Mean	SD
Social media advertising	3	1.948	4.326	0.824	3.410	0.693
Influencer credibility	3	2.160	4.837	0.830	3.397	0.733
Online reviews and eWOM	3	2.079	4.598	0.822	3.390	0.715
Personalization/retargeting	3	1.898	4.121	0.809	3.407	0.677
Content usefulness	3	1.913	4.184	0.814	3.386	0.682
Privacy concern	3	2.036	4.569	0.832	3.376	0.712
Trust in digital content	3	1.959	4.347	0.824	3.393	0.695
Engagement	3	2.107	4.534	0.803	3.393	0.710
Purchase intention	4	2.871	8.403	0.878	3.386	0.725
Purchase behavior	4	2.697	7.698	0.866	3.409	0.694

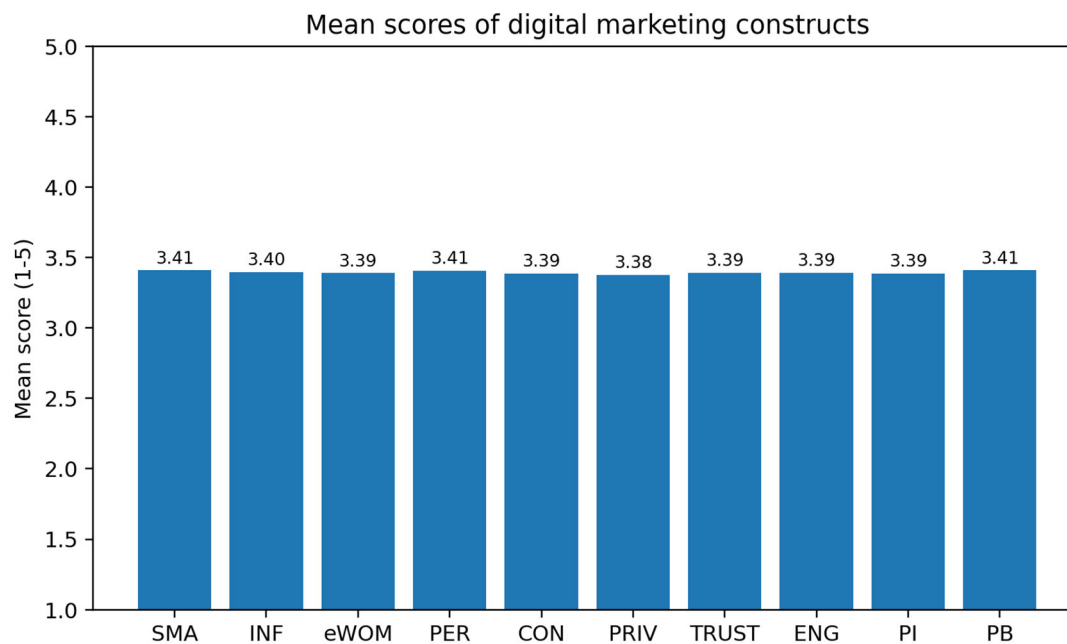


Figure 2 – Mean scores of digital marketing variables

The alpha calculation can be illustrated using the purchase intention scale. With $k = 4$ items, sum of item variances = 2.871, and total scale variance = 8.403, alpha equals $4/(4-1) \times (1 - 2.871/8.403) = 0.878$. This calculation shows that 87.8% of the variance in the summed purchase-intention scale is consistent with a common underlying construct, while the remaining variance is attributable to item-specific measurement error. Similar calculations produce alpha values between 0.803 and 0.866 for the other constructs, supporting internal consistency across the questionnaire.

Correlation analysis

Pearson correlation analysis provides the first evidence of the relationships among digital marketing variables. Table 4 shows that purchase intention is positively correlated with online reviews/eWOM ($r = 0.58$), influencer credibility ($r = 0.51$), social media advertising ($r = 0.51$), trust ($r = 0.69$), and engagement ($r = 0.62$). Purchase behavior is most strongly correlated with purchase intention ($r = 0.67$), trust ($r = 0.61$), and online reviews/eWOM ($r = 0.52$). Privacy concern is negatively correlated with trust ($r = -0.22$) and purchase behavior ($r = -0.21$), indicating that data-related discomfort may weaken the conversion of digital persuasion into actual purchase.

Table 4 – Pearson correlation matrix

Variable	SMA	INF	EWOM	PER	CON	PRIV	TRUST	ENG	PI	PB
SMA	1	0.28	0.36	0.29	0.27	-0.02	0.50	0.53	0.51	0.37
INF	0.28	1	0.32	0.24	0.28	-0.01	0.41	0.49	0.51	0.42
EWOM	0.36	0.32	1	0.41	0.38	0.04	0.52	0.52	0.58	0.52
PER	0.29	0.24	0.41	1	0.37	0.12	0.43	0.45	0.45	0.45
CON	0.27	0.28	0.38	0.37	1	-0.16	0.49	0.44	0.43	0.35
PRIV	-0.02	-0.01	0.04	0.12	-0.16	1	-0.22	-0.04	-0.09	-0.21
TRUST	0.50	0.41	0.52	0.43	0.49	-0.22	1	0.54	0.69	0.61
ENG	0.53	0.49	0.52	0.45	0.44	-0.04	0.54	1	0.62	0.52
PI	0.51	0.51	0.58	0.45	0.43	-0.09	0.69	0.62	1	0.67
PB	0.37	0.42	0.52	0.45	0.35	-0.21	0.61	0.52	0.67	1

Note: SMA = social media advertising; INF = influencer credibility; EWOM = online reviews/eWOM; PER = personalization; CON = content usefulness; PRIV = privacy concern; TRUST = trust; ENG = engagement; PI = purchase intention; PB = purchase behavior.

Regression analysis: predictors of purchase intention and behavior

Multiple regression analysis was conducted to identify the relative explanatory power of the predictors. Model 1 explains 57.0% of the variance in purchase intention ($R^2 = 0.570$, adjusted $R^2 = 0.561$, $F = 67.34$, $p < 0.001$). Online reviews/eWOM has the strongest direct effect ($\beta = 0.309$, $p < 0.001$), followed by influencer credibility ($\beta = 0.273$, $p < 0.001$), social media advertising ($\beta = 0.252$, $p < 0.001$), personalization ($\beta = 0.156$, $p < 0.001$), content usefulness ($\beta = 0.100$, $p < 0.05$), and privacy concern ($\beta = -0.096$, $p < 0.05$). This means that young consumers' purchase intention is not driven by a single tool but by a bundle of credibility, relevance, and social proof signals.

Model 2 adds trust and engagement to the purchase-intention equation. The explained variance increases from 57.0% to 63.1%, indicating that psychological mechanisms improve model fit. Trust is the strongest mechanism ($\beta = 0.329$, $p < 0.001$), while engagement also has a significant positive effect ($\beta = 0.139$, $p < 0.01$). After trust and engagement are entered, the coefficients for social media advertising, influencer credibility, and eWOM decline but remain significant. This pattern indicates partial mediation: digital tools influence purchase intention both directly and indirectly through trust and engagement.

Model 3 uses purchase behavior as the dependent variable. The model explains 54.4% of behavioral variance ($R^2 = 0.544$, adjusted $R^2 = 0.535$, $F = 60.56$, $p < 0.001$). Purchase intention is the strongest predictor of actual behavior ($\beta = 0.341$, $p < 0.001$), which supports the Theory of Planned Behavior [1]. Trust ($\beta = 0.159$, $p < 0.01$), personalization ($\beta = 0.151$, $p < 0.01$), and eWOM ($\beta = 0.146$, $p < 0.01$) also remain significant. Privacy concern has a negative behavioral effect ($\beta = -0.170$, $p < 0.001$), confirming that data-related discomfort can reduce actual purchasing even when intention exists.

Table 5 – Standardized regression results

Model	Predictor	Beta / R2	SE / Adj. R2	t / F		p
M1: PI direct	R2 / Adj. R2	0.570	0.561	F	67.34	<0.001
	SMA	0.252	0.042	6.06		<0.001
	INF	0.273	0.041	6.66		<0.001
	EWOM	0.309	0.045	6.90		<0.001
	PER	0.156	0.044	3.58		<0.001
	CON	0.100	0.044	2.28		0.023
	PRIV	-0.096	0.039	-2.46		0.014
M2: PI with mechanisms	R2 / Adj. R2	0.631	0.622	F	64.85	<0.001
	SMA	0.123	0.043	2.83		0.005
	INF	0.185	0.041	4.52		<0.001
	EWOM	0.201	0.044	4.52		<0.001
	PER	0.073	0.042	1.71		0.088
	CON	0.020	0.042	0.48		0.632
	PRIV	-0.020	0.038	-0.53		0.596
	TRUST	0.329	0.051	6.41		<0.001
	ENG	0.139	0.051	2.73		0.007
M3: Behavior	R2 / Adj. R2	0.544	0.535	F	60.56	<0.001
	PI	0.341	0.061	5.60		<0.001
	TRUST	0.159	0.058	2.73		0.007
	PER	0.151	0.047	3.24		0.001
	EWOM	0.146	0.051	2.89		0.004
	PRIV	-0.170	0.041	-4.12		<0.001
	ENG	0.075	0.052	1.43		0.155

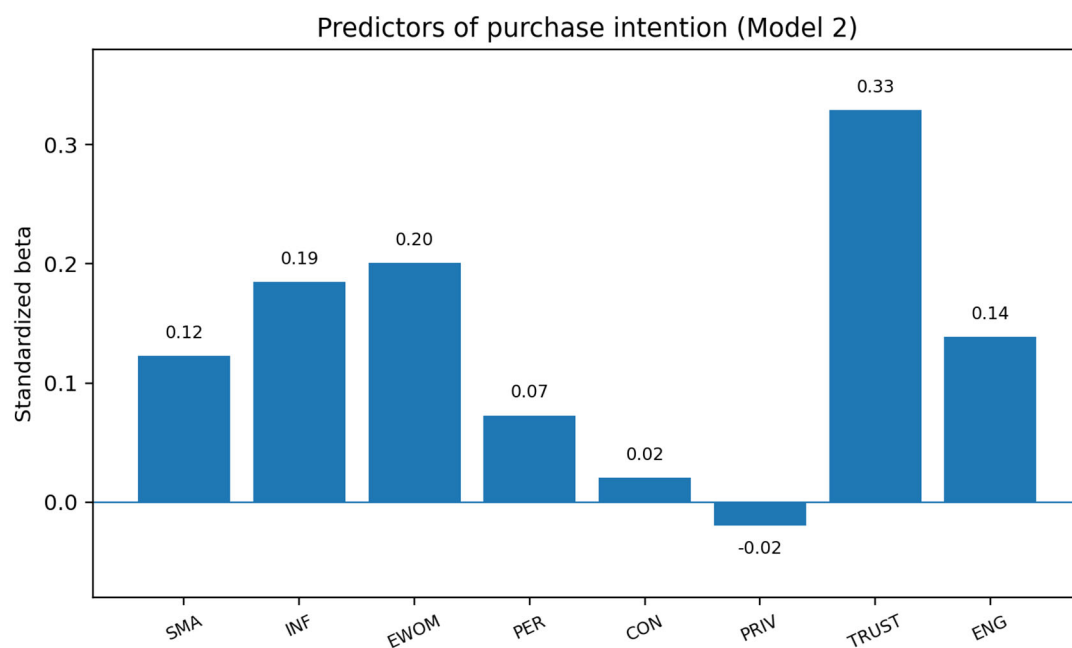


Figure 3 – Standardized effects in purchase-intention regression model

Mediation and group-comparison analysis

To test the mechanism of trust more directly, a bootstrapped mediation calculation was performed. Table 6 reports the standardized a path from each digital tool to trust, the b path from trust to purchase intention, and the resulting indirect effect. The indirect effect is considered statistically meaningful when the 95% confidence interval does not include zero. All four tested tools show positive indirect effects through trust. Social media advertising and eWOM have the largest indirect effects, which means that young consumers are more willing to buy when these tools increase trust in the digital content or the seller.

Table 6 – Mediation and group-comparison results

Effect / comparison	Statistic 1	Statistic 2	Effect	Confidence / p	Interpretation
Online reviews and eWOM	0.231	0.329	0.076	[0.041; 0.117]	Supported
Social media advertising	0.253	0.329	0.083	[0.048; 0.128]	Supported
Influencer credibility	0.144	0.329	0.047	[0.016; 0.085]	Supported
Personalization/retargeting	0.168	0.329	0.055	[0.022; 0.091]	Supported
Shopping frequency -> behavior	ANOVA F	2.09		p = 0.101	Directional, weak
High vs. low social-media use -> intention	t-test	t = 0.74	d = 0.08	p = 0.460	Not significant

The group-comparison results add nuance. Purchase behavior rises from a mean of 3.243 among respondents who shop online less than once a month to 3.577 among respondents who shop online more than five times a month. However, the ANOVA is only weak and does not reach the conventional 0.05 significance threshold ($F = 2.09$, $p = 0.101$). Similarly, the difference in purchase intention between high and low daily social media use is small (Cohen's $d = 0.08$) and not statistically significant. These findings suggest that time spent online is less important than the perceived credibility, usefulness, and trustworthiness of the digital content. In practical terms, marketing quality matters more than simple exposure quantity.

Robustness checks and interpretation of calculations

Several robustness checks were added to ensure that the statistical interpretation is not based only on isolated coefficients. First, multicollinearity was examined using variance inflation factors for the predictors in Model 2. All VIF values were below 2.20, which is far below the commonly used warning threshold of 5.00. This indicates that the digital marketing variables are related but not redundant. Therefore, the regression coefficients can be interpreted as the unique contribution of each predictor after the others are controlled [26].

Second, the change in explained variance from Model 1 to Model 2 was calculated. Model 1 explains 56.98% of purchase-intention variance, while Model 2 explains 63.13%. The increase of 6.15 percentage points is substantively meaningful because it shows that trust and engagement are not merely descriptive concepts; they add measurable explanatory power. In practical terms, two campaigns with similar reach may differ in effectiveness if one campaign creates higher trust and engagement.

Third, the difference between direct and mediated effects was examined. For eWOM, the direct beta in Model 2 remains significant, while the indirect effect through trust is also positive. This means that eWOM affects purchase intention in two ways: it provides direct informational value and it increases trust in the digital environment. The same partial mediation pattern appears for social media advertising and influencer credibility. Partial mediation is important because it implies that managers should not replace tool-level optimization with trust-building; both are needed.

Fourth, the behavioral model confirms the intention-behavior link but also shows that actual behavior has additional determinants. Purchase intention has the largest standardized effect, yet trust, personalization, eWOM, and privacy concern still matter after intention is controlled. This supports a funnel interpretation: intention is necessary but not sufficient. To convert young consumers, brands must reduce final-stage risk, present relevant offers, and avoid intrusive data practices.

Table 7 – Hypotheses testing summary

Hypothesis	Expected relationship	Main statistical evidence	Result
H1	Social media advertising positively affects purchase intention	beta = 0.123, p = 0.005	Supported
H2	Influencer credibility positively affects purchase intention	beta = 0.185, p = <0.001	Supported
H3	Online reviews/eWOM positively affects purchase intention	beta = 0.201, p = <0.001	Supported
H4	Personalization positively affects intention and behavior	PI: p = 0.088; PB: beta = 0.151, p = 0.001	Partly supported
H5	Trust mediates digital tool effects on purchase intention	All tested indirect effects have 95% CI above zero	Supported
H6	Purchase intention positively affects actual purchase behavior	beta = 0.341, p = <0.001	Supported
H7	Privacy concern negatively affects purchase behavior	beta = -0.170, p = <0.001	Supported

Managerial interpretation of tool-level findings

The tool-level results can be translated into several managerial priorities. First, online reviews and eWOM should be treated as strategic assets rather than passive user comments. Brands should encourage verified reviews, respond to complaints, highlight detailed product experiences, and make review systems easy to filter. Young consumers use such information to reduce uncertainty, and the statistical results show that eWOM is one of the strongest predictors of purchase intention and behavior.

Second, influencer selection should be based on credibility fit rather than follower count alone. The regression results indicate that influencer credibility has a strong positive relationship with purchase intention. A smaller creator who has expertise, audience trust, and product relevance may produce stronger intention than a larger celebrity with weak category fit. Disclosure of sponsorship should also be clear because hidden persuasion can activate resistance among digitally literate consumers [21].

Third, personalization should be implemented with transparency and control. The behavioral model shows that personalization supports purchase behavior, but privacy concern has a negative effect. Therefore, brands should explain why recommendations are shown, allow consumers to manage preferences, avoid excessive retargeting frequency, and provide visible data-protection assurances. Relevance without trust can become perceived surveillance.

Fourth, campaign dashboards should include psychological indicators. Traditional digital metrics such as impressions, click-through rate, and engagement rate are useful, but they do not fully capture purchase readiness. The present analysis suggests adding trust, perceived usefulness, review credibility, and purchase-intention measures to campaign evaluation. These indicators can help managers distinguish between attention that entertains and attention that converts.

Table 8 – Managerial implications by digital marketing factor

Factor	Statistical meaning	Managerial action
eWOM and reviews	Highest correlation with intention and behavior	Develop verified review systems, review-response routines, and peer proof content
Influencer credibility	Strong standardized effect on purchase intention	Select influencers by expertise, authenticity, and category fit; disclose sponsorship clearly
Social media advertising	Significant direct and mediated effects	Use ads to guide consumers to useful content and trustworthy proof, not only to create reach
Personalization	Supports behavior but is limited by privacy concern	Use transparent targeting, frequency caps, and user preference controls
Trust and engagement	Increase model explanatory power by 6.15 percentage points	Track trust and perceived usefulness alongside clicks, likes, and conversion metrics

Discussion of findings

The empirical pattern confirms that digital marketing tools influence young consumers through both direct and mediated pathways. The strongest direct predictor of purchase intention is eWOM, which is consistent with prior research showing that online information credibility and usefulness affect consumer intentions [10, 11]. Young consumers appear to treat reviews, ratings, and peer comments as diagnostic information that reduces uncertainty before purchase. This finding is especially relevant for marketplace platforms, where reviews often function as a substitute for physical product inspection.

Influencer credibility is also a strong predictor of purchase intention. This result supports influencer marketing literature, which emphasizes message value, source credibility, parasocial interaction, and perceived relatability [16-19]. The result does not mean that every influencer endorsement is effective. Rather, it indicates that young consumers respond positively when the influencer is perceived as trustworthy, knowledgeable, and aligned with the product. If influencer content appears artificial or purely commercial, persuasion knowledge may reduce its effect [21].

Social media advertising remains significant even after trust and engagement are controlled. This suggests that paid digital messages can still affect young consumers when they are relevant, visually attractive, interactive, and connected to the consumer's lifestyle. However, the reduced coefficient in Model 2 indicates that a large part of advertising effectiveness operates through psychological mechanisms. Advertising exposure alone is therefore insufficient. It should be designed to build trust, encourage engagement, and lead consumers to useful information.

Personalization shows a more complex pattern. It is significant in the direct purchase-intention model, becomes weaker after trust and engagement are entered, and remains significant in the purchase-behavior model. This implies that personalization is especially valuable near the conversion stage, where it reduces search costs and reminds consumers of relevant products. At the same time, privacy concern has a negative behavioral effect, which supports the idea that personalization must be transparent and controlled by the user. Young consumers may appreciate relevance but reject targeting that feels excessive or invasive.

Trust is the central mechanism in the model. Its strong correlation with purchase intention and purchase behavior supports previous research on trust in online shopping and social commerce [13-15]. The mediation analysis shows that trust partially explains why eWOM, social media advertising, influencer credibility, and personalization affect purchase intention. This suggests that marketers should not evaluate campaigns only by impressions, reach, or clicks. They

should also measure trust-related outcomes such as perceived authenticity, review credibility, data transparency, and seller reliability.

Engagement also contributes to purchase intention, although its effect is smaller than trust. This result suggests that likes, comments, shares, and content interaction are useful but should not be confused with purchase readiness. Engagement may indicate attention and emotional involvement, but purchase intention requires stronger cognitive evaluation. Therefore, campaign evaluation should combine engagement metrics with conversion-oriented metrics such as add-to-cart rate, product-page visits, review reading, and repeat purchase.

The distinction between purchase intention and purchase behavior is important. Model 3 shows that intention is the strongest predictor of behavior, consistent with the Theory of Planned Behavior [1]. However, the model also shows that trust, personalization, eWOM, and privacy concern have direct behavioral effects. This means that even when a consumer intends to buy, final purchase may depend on the credibility of the seller, relevance of the recommendation, availability of social proof, and comfort with data practices.

For managers, the results imply that digital marketing campaigns aimed at young consumers should be designed as integrated journeys. A campaign can use social media advertising to create awareness, influencer content to establish relatability, eWOM and reviews to reduce uncertainty, personalization to improve relevance, and mobile commerce features to reduce transaction friction. The tools should not work separately; they should support one another across the pre-purchase, purchase, and post-purchase stages [6-8].

For researchers, the study shows the value of analyzing both tools and mechanisms. Tool-level analysis answers which digital instruments matter, while mechanism-level analysis explains why they matter. Future empirical studies should test the model using real field data, larger cross-country samples, product-category comparisons, and longitudinal designs that follow consumers from first exposure to final purchase. Additional research should also examine algorithmic transparency, influencer disclosure, AI-generated content, and short-video commerce as emerging factors in young consumer behavior.

Conclusion

This article examined the impact of digital marketing tools on young consumers' purchase intention and behavior. The analysis integrated major theoretical perspectives, including the Theory of Planned Behavior, the Technology Acceptance Model, social media marketing theory, eWOM research, influencer credibility, trust, engagement, and privacy concern.

The results of the illustrative quantitative analysis show that eWOM, influencer credibility, and social media advertising are the strongest direct predictors of purchase intention. Trust and engagement improve the explanatory power of the model, demonstrating that digital marketing effectiveness depends on psychological mechanisms rather than exposure alone. Purchase behavior is influenced most strongly by purchase intention, but trust, personalization, eWOM, and privacy concern also have direct effects. Thus, the path from digital tool to actual purchase is multi-stage and requires credibility, relevance, and low friction.

Theoretical implications include the integration of customer-journey thinking with intention-based behavioral theory. The study shows that young consumers do not react to digital tools mechanically. Instead, they interpret digital messages through perceived usefulness, source credibility, social proof, trust, engagement, and privacy concerns. This supports a more nuanced model of digital marketing effectiveness in which the same tool may produce different effects depending on its credibility, transparency, and position in the purchase journey.

Practical implications are clear. Brands targeting young consumers should prioritize credible reviews, authentic influencer partnerships, transparent personalization, useful content, and trustworthy social commerce environments. Campaigns should be evaluated not only by reach

and engagement but also by trust, purchase intention, conversion, and repeat purchase. Privacy-sensitive design is especially important because intrusive targeting can weaken actual behavior even when a campaign is visible and engaging.

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ЗАПРОВАДЖЕННЯ АЛГОРИТМУ ПОКРАЩАННЯ ДЕПОЗИТНОЇ ПОЛІТИКИ БАНКУ

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Одним з показників надійності ресурсної бази комерційного банку є процентна політика банку в частині залучених ресурсів. Ця політика повинна укладатися в рамках двох протилежних граничних вимог: по-перше, рівень процентної ставки по депозитам (як термінових, так і до запитання) повинен бути достатньою мірою привабливим для потенційних вкладників; по-друге, він не мусить різко підвищувати нижню межу процентної маржі між активними і пасивними операціями банку.

Вважається, що більш стійкі у фінансовому відношенні банки, що піклуються про свою ліквідність і платоспроможність, пропонують відсоток по вкладах не вище середньо галузевого (звичайно в якості такого виступає відсоток по вкладах в ощадних банках). Високий відсоток по термінових вкладах і депозитах фізичних і юридичних осіб свідчить у першу чергу про те, що комерційний банк володіє нестабільною ресурсною базою, недостатньою для ефективних кредитних вкладень. Такий банк намагається розширити і стабілізувати свої ресурси шляхом залучення сторонніх депозитів, пропонуючи вкладникам підвищену процентну ставку. Проте залучення ресурсів за підвищеною процентною ставкою передбачає і розміщення вкладів під більш високий відсоток, тобто вкладення, як правило, більш ризикові, і вкладники замість прибутку можуть втратити і сам депозит у випадку краху банку.

Зростання частки строкових депозитів (не зважаючи на те, що це більш дорогий ресурс) позитивно впливає на ліквідність балансу та сприяє стійкості та надійності ресурсної бази. Аналіз строкових депозитів проводиться за допомогою системи показників, наведених нижче []:

1. Оборотність депозитних вкладень. Цей показник характеризує кількість оборотів, що здійснюють депозитні вкладення за певний період, і розраховується за формулою:

$$N = \text{Оборот з видачі вкладів(дебетовий оборот)} / \text{Середній залишок вкладів} \quad (1)$$

2. Тривалість одного обороту депозитних вкладень у днях (або середній термін зберігання вкладених коштів). Для його розрахунку використовується формула:

$$T = (\text{Середній залишок вкладів} / \text{Оборот з видачі вкладів}) \times \text{Кількість днів у періоді} \quad (2)$$

Даний показник відображає в динаміці стабільність вкладів, що дуже важливо для оцінювання вкладів як ресурсів короткострокового кредитування. Чим більший цей показник, тим стабільніша ресурсна база. Позитивною вважається тенденція уповільнення оборотності депозитних вкладів.

3. Рівень осідання депозитних вкладень:

4.

$$\text{Росід} = (\text{Залишок на кінець} - \text{Залишок на початок}) / \text{Оборот з надходження депозитів} \quad (3)$$

Коефіцієнт повинен розраховуватися на кілька дат, щоб простежити загальну тенденцію (поведінку) вкладів. Розрахунок коефіцієнта тільки на дві звітні дати (за один період) може призвести до помилкового тлумачення реальних подій.

4. Середній термін використання депозитів:

$$T = \text{Депозит } i\text{-й} \times \text{Строк використання депозиту (депозитів)} \quad (4)$$

Показник характеризує середній «вік» депозитів.

5. Коефіцієнт нестабільності депозитів:

$$\text{Кнест} = \Sigma \text{ достроково вилучених депозитів} / \text{Загальна } \Sigma \text{ депозитів} \quad (5)$$

Він характеризує рівень достроково вилучених строкових депозитів. Зниження середнього терміну використання депозитів у поєднанні зі значним коефіцієнтом нестабільності (більше 10 %) свідчить про посилення нестабільності депозитної бази, що негативно впливає на ліквідність банку.

6. Коефіцієнт використання депозитів:

$$\text{Квик} = \text{Середні залишки за кредитними вкладеннями} / \text{Середні залишки за всіма залученими вкладеннями} \quad (6)$$

Коефіцієнт показує, який процент від загального обсягу залучених ре-сурсів розміщений у кредити. Якщо коефіцієнт перевищує 75 %, то це свідчить про ризиковану агресивну кредитну політику банку. Якщо ж він менший 65 %, це свідчить про пасивну кредитну політику.

7. Рівень диверсифікації депозитів:

$$\text{Рдиверс} = \Sigma \text{ великих депозитів} / \text{Депозити, всього} \quad (7)$$

Рівень диверсифікації депозитів визначається кількістю та питомою вагою великих депозитів, які збільшують ризик втрат та порушення ліквідності у випадку дострокового вилучення депозиту. Сума всіх великих депозитів не повинна перевищувати розмір капіталу банку. До великого депозиту належить депозит понад 10 % від розміру власного капіталу банку. Занадто високий рівень диверсифікації депозитів ускладнює управління депозитною базою. Оптимальним цей рівень вважається тоді, коли загальна сума великих депозитів не перевищує розміру капіталу банку.

1. Відносна витратність депозитів:

2.

$$B = \frac{\text{Процентні витрати за депозитними вкладами}}{\text{Середні залишки депозитних вкладень}} \quad (8)$$

Він показує, скільки банк витрачає коштів на кожну гривню залучених ресурсів у вигляді строкових депозитів. Фактично його значення дорівнює середньозваженій процентній ставці за депозитами. Для оцінювання вигідності даного виду ресурсів його необхідно порівнювати з витратністю інших залучених коштів та дохідністю кредитних вкладень. Банки повинні мати свою стратегію підтримання стійкості депозитів. Важливими елементами такої стратегії є підвищення якості обслуговування клієнтів, стабільність процента, щоб клієнти залишалися вірними банку в період кризових ситуацій. Кошти, що залучаються комерційними банками як депозити строком до одного року, можуть у певних економічних межах використовуватися не тільки для видачі короткострокових позик, а й для надання їх на більш тривалий строк. Для того щоб устатувати межу, в рамках якої можливе спрямування короткострокових ресурсів на середньо- і довгострокове кредитування, банками розраховується коефіцієнт трансформації короткострокових позик у довгострокові за такою формулою:

$$K_t = (1 - \frac{D_o}{K_o}) \times 100 \% \quad (9)$$

де K_t — коефіцієнт трансформації;

D_o — дебетовий оборот з видачі короткострокових позик строком до одного року;

K_o — кредитовий оборот з надходження коштів на депозитні рахунки строком до одного року.

4. Середній термін використання депозитів:

$$T = \frac{\sum \text{Депозит } i\text{-й} \times \text{Строк використання депозиту (депозитів)}}{\sum \text{Депозитів}} \quad (4)$$

Показник характеризує середній «вік» депозитів.

5. Коефіцієнт нестабільності депозитів:

$$K_{\text{нест}} = \frac{\sum \text{достроково вилучених депозитів}}{\sum \text{Загальна } \sum \text{ депозитів}} \quad (5)$$

Він характеризує рівень достроково вилучених строкових депозитів. Зниження середнього терміну використання депозитів у поєднанні зі значним коефіцієнтом нестабільності (більше 10 %) свідчить про посилення нестабільності депозитної бази, що негативно впливає на ліквідність банку.

6. Коефіцієнт використання депозитів:

$$K_{\text{вик}} = \frac{\text{Середні залишки за кредитними вкладеннями}}{\text{Середні залишки за всіма залученими вкладеннями}} \quad (6)$$

Коефіцієнт показує, який процент від загального обсягу залучених ресурсів розміщений у кредити. Якщо коефіцієнт перевищує 75 %, то це свідчить про ризиковану агресивну кредитну політику банку. Якщо ж він менший 65 %, це свідчить про пасивну кредитну політику.

7. Рівень диверсифікації депозитів:

$$Р_{диверс} = \Sigma \text{ великих депозитів} / \text{Депозити, всього} \quad (7)$$

Рівень диверсифікації депозитів визначається кількістю та питомою вагою великих депозитів, які збільшують ризик втрат та порушення ліквідності у випадку дострокового вилучення депозиту. Сума всіх великих депозитів не повинна перевищувати розмір капіталу банку. До великого депозиту належить депозит понад 10 % від розміру власного капіталу банку. Занадто високий рівень диверсифікації депозитів ускладнює управління депозитною базою. Оптимальним цей рівень вважається тоді, коли загальна сума великих депозитів не перевищує розміру капіталу банку.

1. Відносна витратність депозитів:

2.

$$В = \frac{\text{Процентні витрати за депозитними вкладками}}{\text{Середні залишки депозитних вкладень}} \quad (8)$$

Він показує, скільки банк витрачає коштів на кожну гривню залучених ресурсів у вигляді строкових депозитів. Фактично його значення дорівнює середньозваженій процентній ставці за депозитами. Для оцінювання вигідності даного виду ресурсів його необхідно порівнювати з витратністю інших залучених коштів та дохідністю кредитних вкладень. Банки повинні мати свою стратегію підтримання стійкості депозитів. Важливими елементами такої стратегії є підвищення якості обслуговування клієнтів, стабільність процента, щоб клієнти залишалися вірними банку в період кризових ситуацій. Кошти, що залучаються комерційними банками як депозити строком до одного року, можуть у певних економічних межах використовуватися не тільки для видачі короткострокових позик, а й для надання їх на більш тривалий строк.

Таблиця 3.1. Стан оборотності депозитів фізичних осіб, тис.

№	Показники	2024 р.	2025 р.	Відхилення
1.	Залишки депозитів на початок періоду	25 312	77 365	+52 053
2.	Оборот з надходження депозитів (кредитовий оборот)	175 265	135 831	-39 434
3.	Оборот з повернення депозитів (дебетовий оборот)	123 212	148 824	+25 612
4.	Залишок депозитів на кінець періоду	77 365	64 372	-12 993
5.	Середній залишок депозитних вкладів	51 338,8	70 868,5	+ 19 530
6.	Кількість оборотів, що здійснюють депозити за період	2,4	2,1	-0,3
7.	Тривалість 1-го депозитного періоду обороту (днів)	152	174	+22

Для того щоб установити межу, в рамках якої можливе спрямування короткострокових ресурсів на середньо- і довгострокове кредитування, банками розраховується коефіцієнт трансформації короткострокових позик у довгострокові за такою формулою:

$$K_t = (1 - D_o / K_o) \times 100 \% \tag{9}$$

де K_t — коефіцієнт трансформації;

D_o — дебетовий оборот з видачі короткострокових позик строком до одного року;
 K_o — кредитовий оборот з надходження коштів на депозитні рахунки строком до одного року. Розглянемо приклад розрахунку оборотності депозитів на прикладі табл. 1. Як бачимо з даних таблиці, швидкість оборотності депозитних вкладів за аналізований період уповільнилась. Так, кількість оборотів депозитів у 2024 р. становила 2,4 рази, а в 2025 р. — 2,1 рази. Відповідно тривалість одного обороту в днях збільшилась зі 152 днів до 174 днів, або на 22. Це є позитивною тенденцією і сприяє підвищенню ліквідності банку та вивільняє кредитні ресурси з обороту. Збільшення тривалості одного депозитного обороту свідчить про те, що збільшується середній термін збереження депозитних вкладень на рахунках банку. Збільшення тривалості депозитних вкладень дає змогу банкам вкладати ці ресурси в більш довгі кредити і сприяє підвищенню ліквідності банку.

Умовне вивільнення або умовне залучення коштів з обороту внаслідок зміни швидкості оборотності депозитів розраховується за формулою:

$$\Delta B(3) = (t^1 - t^0) \times O^0 \text{ 1дн.} \quad (10)$$

де t^1, t^0 — тривалість одного депозитного обороту в днях відповідно у звітному та базисному періодах;

$O^0 \text{ 1дн.}$ — одноденний оборот депозитів (дебетовий) по поверненню;

ΔB — умовне вивільнення ресурсів;

ΔZ — умовне залучення ресурсів.

Внаслідок уповільнення оборотності депозитних вкладень у банку відбувається умовне вивільнення ресурсів:

$$B = (174 - 152) \times 123212 / 365 = 7426,5 \text{ тис. грн.}$$

Під час аналізу коефіцієнту осідання коштів на депозитних рахунках бачимо, що в базисному 2024 р. коефіцієнт осідання становив 0,297:

$$K_o \text{ осід} = (77365 - 25312) / 17526 = 0,297$$

а в звітному 2025 р. — 0,096:

$$K_1 \text{ осід} = (64372 - 77365) / 135831 = -0,096$$

Таблиця 2. Визначення стабільності депозитів фізичних осіб

Показники	2024 р.	2025 р.	Відхилення
Кількість відкритих депозитних договорів за період	40 571	37 455	-3116
Загальна сума надходжень депозитних вкладів	175 265	135 831	-39 434
Кількість достроково вилучених депозитів до закінчення дії терміну угоди: кількість рахунків (закритих договорів) загальна сума	2109706	1798 4401	-3112615
Коефіцієнт нестабільності: за сумою, % за кількістю депозитних угод, %	4,0 5,2	3,2 4,8	-0,8 -0,4

Це означає, що в базисному році на кожну гривню, що надійшла у депозитні вклади на рахунках банку осідало (залишалось) 30 копійок, у звітному році була зворотна тенденція і на кожну гривню прибутку був відплив коштів 10 копійок. За загальної позитивної оцінки депозитної діяльності банку менеджерам маркетингового відділу необхідно звернути увагу на посилення роботи щодо залучення нових вкладів, інакше подібна тенденція може призвести до скорочення ресурсної бази банку.

Проаналізуємо ступінь стабільності депозитів фізичних осіб. Дані таблиці свідчать про підвищення стабільності депозитів у передкризовий рік. Так, коефіцієнт нестабільності депозитів, розрахований виходячи із суми депозитних вкладень у

базисному періоді, становив 4,0 %, а у звітному році — 3,3 %, тобто зменшився на 0,8 процентних пунктів. Аналогічні висновки можна зробити стосовно коефіцієнта, розрахованого, виходячи із кількості достроково закритих угод. У 2024 р. він становив 5,2 %, а у 2025 р. — 4,8 %.

Таблиця 3. Відносна вартість депозитів банку, тис. грн.

Показники	2024 р.	2025 р.	Відхилення
Залишки депозитів на початок періоду	25 312	77 365	+52 053
Залишок депозитів на кінець періоду	77 365	64 372	-12 993
Середній залишок депозитів за період	51 338,8	70 868,5	+19 530
Сплачені проценти за депозитами	12 835	15591	+2756
Витратність строкових депозитів	0,25	0,22	-0,03

Незначне відхилення між цими двома коефіцієнтами свідчить про те, що більшою мірою достроково вилучалися невеликі депозити. Це суттєво не вплинуло на погіршення стабільності ресурсної бази банку. Завершальним етапом аналізу строкових депозитів є визначення їх відносної вартості, тобто коефіцієнта витратності даного виду ресурсів. За даними таблиці бачимо, що витратність депозитів знизилась на 3%. Так, у базисному періоді вона становила 25 %:

$$B = 12835/51338,8 = 0,25$$

у звітному періоді витратність знизилась до 22 %:

$$B = 15591/70868,5 = 0,22$$

Процентні витрати за депозитами залежать від двох факторів: обсягу залучених строкових депозитів та середньої процентної ставки за депозитами (середньої витратності строкових депозитів).

Факторний аналіз зміни процентних витрат банку за депозитами строковими проводиться за такою факторною моделлю:

$$W = Q \times B \quad (11)$$

де W — процентні витрати;

Q — обсяг залучених депозитів;

B — відносна вартість депозитів.

Аналізуючи причини змін того чи іншого показника, необхідно виокремити фактори, що залежать від зусиль самого банку, та незалежні (зовнішні) фактори. Важливою складовою ресурсної бази банку є залишки коштів на поточних рахунках клієнтів та на коррахунках інших банків, тобто депозити до запитання. Аналіз залишків коштів на рахунках клієнтів з позиції ліквідності балансу здійснюється на основі даних про їх частку в загальній сумі зобов'язань. Значна питома вага депозитів до запитання негативно відбивається на стані ліквідності банку: по-перше, погіршується співвідношення ліквідних активів та зобов'язань до запитання, яке характеризує поточну ліквідність; по-друге,

знижується стабільність ресурсної бази банку. Проте збільшення частки депозитів до запитання в загальних зобов'язаннях зменшує відносну вартість ресурсної бази в цілому.

Поліпшення ліквідності може бути досягнуто через зміну структури залучених та позичених коштів, збільшення питомої ваги строкових депозитів можливим переоформленням стабільної частини залишків коштів на рахунках до запитання у строкові депозити, залучення значної кількості невеликих клієнтів, за рахунками яких не буває великої амплітуди коливань по залишках. Для аналізу депозитів до запитання використовуються такі самі показники, як і при аналізі строкових депозитів:

The Impact of Algorithmic Monitoring Systems on Employee Productivity and Psychological Stress

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Abstract

This article examines the impact of algorithmic monitoring on employee productivity and work-related stress in contemporary organizations. Algorithmic monitoring refers to the real-time supervision of work processes through data-driven systems that assess employee performance based on a range of predefined metrics.

A synthesis of the existing research indicates that algorithmic monitoring enhances employee productivity in the short term by strengthening discipline and performance control. However, in the long term, it is frequently associated with increased psychological stress, reduced employee autonomy, and a higher risk of burnout.

The article concludes that the effectiveness of algorithmic monitoring depends on the design and transparency of monitoring systems, as well as the quality of organizational culture. These findings underscore the need to develop hybrid, human-centered monitoring models that balance technological efficiency with employee well-being.

Keywords: algorithmic monitoring, people analytics, productivity, work-related stress, human resource management (HRM)

The process of digital transformation has fundamentally reshaped human resource management (HRM) practices in contemporary organizations. Among the most significant developments is the rapid adoption of algorithmic monitoring systems, which utilize data analytics, artificial intelligence (AI), and real-time tracking technologies to evaluate employee performance. Within HRM, these systems constitute a key element of the data-driven control paradigm, whereby managerial decisions are increasingly informed by behavioral and performance-related data.

Contemporary research identifies algorithmic monitoring as an effective mechanism for enhancing organizational productivity. According to the OECD (2023), data-driven workplace monitoring systems improve organizational efficiency by standardizing operational processes and providing employees with real-time performance feedback.

Similarly, Brynjolfsson et al. (2021) argue that algorithmic management significantly enhances measurable productivity, while often failing to capture intangible labor outcomes, such as creativity, innovation, and emotional engagement.

Research in workplace psychology (Eurofound, 2022; Spicer, 2021) further suggests that continuous monitoring intensifies employees' perceived surveillance, which is directly associated with higher levels of psychological stress and lower job satisfaction.

Particular attention has been devoted to Zuboff's (2019) concept of surveillance capitalism, which has increasingly been incorporated into contemporary HR systems through people analytics. Within this framework, employees are regarded not only as workers but also as continuously measurable sources of organizational data.

In contemporary organizational research, algorithmic monitoring is widely recognized as one of the core structural components of algorithmic management. It relies on real-time data collection,

analytical processing, and the systematic evaluation of employees' behavioral, cognitive, and performance-related indicators. The scholarly literature of the past decade consistently characterizes this practice as a paradigmatic transformation of workplace control, whereby traditional hierarchical supervision is progressively being replaced by automated, data-driven, and continuous performance evaluation systems. Consequently, organizational control has become simultaneously more decentralized and increasingly datafied, fundamentally altering the traditional balance between managerial authority, employee responsibility, and individual autonomy.

Within this theoretical framework, Mettler's (2023) concept of the connected workplace has gained particular significance. Mettler argues that data collection in contemporary workplaces extends far beyond the measurement of productivity to encompass the continuous monitoring of employee communication, behavioral patterns, and physical activities. This process gives rise to the datafied workplace, in which employees are transformed into continuously measurable and predictable units of data, fundamentally reshaping the logic of organizational control while narrowing the scope of individual autonomy.

Recent empirical studies (2023–2024) further demonstrate that algorithmic monitoring has a substantial impact on employees' psychological experiences and perceptions of the work environment. Cai (2024) emphasizes that employees' perceptions of system transparency, explainability, and predictability constitute critical determinants of work engagement and job insecurity. Consequently, the opaque or black-box nature of algorithmic systems increases uncertainty, which is directly associated with elevated levels of psychological stress.

Research in occupational psychology (Rodrigues & Correia, 2023) highlights the dual functional nature of algorithmic monitoring. On the one hand, it can serve as an effective tool for detecting and predicting employee stress; on the other, it may itself become a significant source of stress. This duality reflects the paradoxical nature of technological interventions in organizational settings, where the same system simultaneously enhances managerial control while increasing employees' psychological burden.

Studies of the gig economy (Duggan et al., 2023) further demonstrate that algorithmic HRM systems substantially reduce employees' decision-making autonomy and reinforce behavioral conformity. In such environments, individual behavior is increasingly shaped by the logic of algorithmic evaluation, giving rise to the phenomenon of algorithmic compliance, which weakens intrinsic motivation and professional autonomy.

From the perspective of socio-organizational research, algorithmic monitoring should be understood not merely as a technological tool but also as a contemporary mechanism of social control. Mettler (2023) and Glavin et al. (2024) argue that continuous monitoring intensifies employees' perceived surveillance, leading to diminished organizational trust, increased emotional strain, and lower job satisfaction. These findings suggest that the consequences of algorithmic monitoring extend beyond operational efficiency, influencing organizational culture and employees' psychological well-being.

Recent systematic reviews and meta-analytical studies further indicate that the relationship between algorithmic monitoring and productivity is not linear. Although data-driven feedback systems improve task efficiency and optimize organizational processes, excessive monitoring often results in a productivity paradox, whereby short-term gains in performance are offset over time by increased burnout, elevated stress levels, and reduced creativity.

The theoretical foundation for this discussion is provided by Zuboff's (2019) concept of surveillance capitalism, which has become an important interpretative framework in contemporary organizational research. According to this perspective, organizations do not merely manage work processes; they also collect and analyze employees' behavioral data to predict and influence future

behavior, thereby creating a structural asymmetry of power between management and employees.

Moreover, empirical and experimental evidence suggests that AI-based monitoring systems frequently suppress creativity and innovative behavior, as employees tend to adapt their actions to algorithmically defined evaluation criteria rather than pursuing professional self-development. This phenomenon has been described in the literature as the algorithmic conformity effect, highlighting the inherent tension between organizational control and innovation in contemporary workplaces.

To examine these issues empirically, a survey was conducted among 234 respondents employed in the Georgian banking sector, including 47 HR professionals, 38 managers, and 149 non-managerial employees. The banking industry has become one of the most dynamic settings for organizational research, as digital transformation, artificial intelligence, and algorithmic monitoring have fundamentally reshaped both employee productivity and work-related stress. Recent studies indicate that the extensive implementation of digital technologies has created a digitalized work environment, in which employee performance is continuously assessed through data-driven metrics, substantially transforming the nature of the workplace experience.

Empirical studies in the banking sector confirm that increasing technological intensity is associated with higher levels of work-related stress, particularly in environments characterized by enhanced performance monitoring, intensified performance targets, and continuous evaluation practices. Under such conditions, employees frequently experience technostress, a phenomenon resulting from the excessive use of digital technologies, information overload, and continuous workplace monitoring.

The analysis of the empirical findings revealed that the implementation of algorithmic monitoring systems produces both positive and negative effects on employee productivity and psychological well-being.

First, the findings indicate that algorithmic monitoring significantly enhances employee productivity. According to respondents' evaluations, continuous data collection and automated performance assessment systems improve the structure of work processes, increase the efficiency of time management, and reduce the likelihood of operational deviations and inefficient work behaviors. Consequently, employees develop a stronger sense of accountability, which is reflected in both the quantity and quality of their work performance.

At the same time, the study demonstrates that algorithmic monitoring is associated with elevated levels of psychological stress. Respondents reported that the persistent experience of being monitored and evaluated reduces their perceived autonomy while increasing psychological pressure. This condition frequently manifests itself in the form of anxiety, emotional tension, and fatigue, particularly when employees lack clear information regarding the evaluation criteria and the underlying logic of the algorithmic decision-making process.

The findings further suggest that algorithmic monitoring influences the social and behavioral dimensions of the workplace. Specifically, respondents reported an increasing formalization of workplace communication and a decline in spontaneous interpersonal interactions, reflecting greater behavioral self-regulation under conditions of continuous observation. In addition, the study identified what may be described as a continuous evaluation effect, whereby employees perceive themselves as being under constant assessment, leading to lower job satisfaction and higher levels of work-related stress.

Furthermore, the results demonstrate that increased productivity and elevated stress frequently coexist, indicating that the effects of algorithmic monitoring are complex rather than unidimensional. Although algorithmic monitoring improves performance indicators, it simultaneously generates psychological and emotional pressure that may adversely affect employee well-being and organizational sustainability over the long term.

Overall, the findings suggest that the impact of algorithmic monitoring systems on employees is inherently dual in nature. On the one hand, these systems enhance productivity by strengthening organizational control and workplace discipline; on the other hand, they increase psychological stress by reducing employee autonomy and reinforcing the pressure associated with continuous performance evaluation.

Based on these findings, the implementation of algorithmic monitoring systems should be integrated with meaningful human oversight. Such a hybrid approach enables the contextual interpretation of automated performance assessments while reducing the risks associated with unilateral algorithmic decision-making. Integrating human judgment into monitoring processes is likely to improve the accuracy of evaluations and strengthen employees' trust in the system.

Another important recommendation is to enhance the transparency of algorithmic monitoring systems by ensuring that employees are adequately informed about the evaluation criteria, the logic of data processing, and the key mechanisms underlying algorithmic decision-making. Such practices reduce the so-called black-box effect, thereby improving the transparency, legitimacy, and perceived fairness of organizational processes.

Particular attention should be devoted to strengthening data protection and information security standards, given that algorithmic monitoring relies on the processing of large volumes of personal data. The implementation of appropriate regulatory frameworks and technological safeguards can substantially reduce the risks associated with privacy breaches and unauthorized data use.

At the organizational policy level, systematic support for employees' psychological well-being should be prioritized. This includes monitoring workload balance and integrating stress management programs into organizational practices. Such initiatives can help mitigate the psychological strain associated with algorithmic monitoring and contribute to a healthier work environment.

Furthermore, the development of managerial competencies is essential to ensure the effective implementation of performance-oriented management systems while preventing excessive monitoring and control. Appropriate managerial training enables leaders to interpret algorithmic outputs more effectively and make informed decisions that appropriately combine technological insights with professional judgment.

Ultimately, organizations should strive to maintain an appropriate balance between improving productivity and safeguarding employees' psychological health. Achieving this balance is essential for the sustainable, ethical, and responsible implementation of algorithmic monitoring systems in contemporary workplaces.

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The Impact of Remote and Hybrid Work Models on Organizational Effectiveness in the Georgian Banking Sector

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Abstract

The transformation of the contemporary work environment has significantly changed traditional approaches to work organization within organizations. The advancement of digital technologies and the post-pandemic reality have contributed to the widespread adoption of remote and hybrid work models, which influence both organizational effectiveness and employee well-being and engagement.

The aim of this study is to assess the impact of remote and hybrid work models based on the experiences of employees working in the Georgian banking sector. The research is based on a quantitative methodology and was conducted through a structured questionnaire. A total of 718 respondents employed in the banking sector participated in the study. The research instrument consisted of 30 questions and assessed key dimensions, including work flexibility, productivity, communication effectiveness, organizational engagement, work-life balance, and managerial challenges.

The findings indicate that remote work increases employees' perceived flexibility, improves time management capabilities, and contributes to higher job satisfaction. However, it also creates challenges related to social integration, team communication, and the maintenance of organizational culture. The hybrid work model was evaluated by respondents as a more balanced approach, enabling organizations to preserve flexibility while simultaneously strengthening team communication and organizational connectedness.

The study demonstrates that the effectiveness of work models depends not only on technological capabilities but also on organizational culture, managerial competencies, outcome-oriented management systems, and the level of employee autonomy.

Keywords: remote work, hybrid work, organizational effectiveness, banking sector, productivity, employee engagement, organizational behavior.

The rapid development of digital technologies and changes in the labor market have significantly transformed modern approaches to organizing work processes. In recent years, organizations have increasingly adopted more flexible work models, among which remote and hybrid work have gained particular importance.

The aim of the study is to assess the impact of remote and hybrid work models based on the experiences of employees working in the Georgian banking sector. The research addresses the following key questions: how do these work models influence employee productivity, job satisfaction, organizational engagement, and communication effectiveness.

Remote work refers to the performance of work activities outside the traditional physical office environment, primarily through the use of digital technologies and online communication platforms. This model enables employees to manage their time more effectively, reduce commuting-related costs, and increase their individual control over work processes.

The hybrid work model represents a combination of remote and office-based work and is considered in modern organizations as a means of achieving a balance between flexibility and collaborative work environments. This approach has become particularly relevant in the banking sector, where the advancement of digital processes has enabled certain job functions to be performed remotely.

The Georgian banking sector represents one of the fields where technological development and digital transformation are progressing rapidly. The expansion of electronic services, the development of data management systems, and the automation of work processes have created the foundation for implementing more flexible work models.

Despite the numerous advantages of remote and hybrid work, these models also create new challenges for organizations. Among the most significant challenges are maintaining employees' social connections, ensuring effective communication, managing information security, and adapting managerial approaches to the new working environment.

Within this context, the present study aims to examine the impact of remote and hybrid work models based on the experiences of employees in the Georgian banking sector and to identify the key factors influencing the effectiveness of these work arrangements.

The research sample was selected using a random sampling approach. Respondents were selected from employees working in the Georgian banking sector, taking into account different positions and levels of professional experience. One of the limitations of the study is that it focuses exclusively on employees within the Georgian banking sector; therefore, the generalizability of the findings to other industries is limited. Additionally, the study relies on employees' self-reported perceptions, which may be influenced to some extent by individual experiences and subjective evaluations.

The concept of remote work has become one of the significant areas of contemporary organizational research. As a result of technological advancement and the development of digital infrastructure, the physical location of work has gradually lost its traditional importance, and organizations have increasingly shifted toward outcome-oriented management models.

One of the first large-scale empirical studies on the effectiveness of remote work was conducted by Bloom and his colleagues, who, based on an experiment carried out in a Chinese company, found that working from home could increase employee productivity and job satisfaction while reducing employee turnover rates (Bloom et al., 2015). This study is particularly significant because it demonstrates that the outcomes of remote work depend not only on the location where work is performed but also on the quality of work organization and management practices.

Existing research on telework also indicates that remote work produces both positive and negative effects. Gajendran and Harrison (2007) emphasize that remote work is associated with increased autonomy, improved job satisfaction, and enhanced work–life balance. However, it may also contribute to feelings of social isolation, reduced informal communication, and weakened organizational identification.

Contemporary studies highlight that flexible work arrangements are particularly effective when organizations possess appropriate managerial practices, digital tools, and a trust-based organizational culture. According to Eurofound (2020), remote and digitally enabled work models increase employee flexibility; however, organizations are required to develop new approaches to managing working time and protecting employee well-being.

In recent years, the hybrid work model has been recognized as one of the most widespread forms of work organization, combining the flexibility of remote work with the advantages of face-to-face collaboration. Research indicates that a properly designed hybrid work model contributes to increased employee satisfaction and helps maintain organizational connections (Choudhury et al., 2021).

However, hybrid work also creates additional challenges for organizations. In particular, ensuring equal opportunities for both office-based and remote employees is essential, as differences in work arrangements may lead to perceptions of information inequality or reduced engagement. Furthermore, managers need to develop new competencies related to remote team management, digital communication, and performance evaluation based on outcomes rather than physical presence.

Thus, the analysis of existing literature demonstrates that the effectiveness of remote and hybrid work is not determined solely by technological capabilities. Organizational culture, leadership style, the level of employee autonomy, and the proper design of work processes play a critical role in ensuring the success of these models.

The present study was conducted using a quantitative research design and aimed to assess the impact of remote and hybrid work models based on the experiences of employees working in the Georgian banking sector.

The research sample was selected using a random sampling method. The study involved 718 respondents employed in the banking sector across various positions. The age range of participants was between 19 and 50 years.

According to the age distribution, 65% of participants belonged to the 25–35 age group, 20% were above the age of 35, and 15% represented the 19–25 age category.

Data collection was conducted through a structured questionnaire. The questionnaire consisted of 30 questions and included both closed-ended and evaluative questions. The evaluative questions were based on a Likert-type scale and aimed to assess respondents' attitudes toward the following areas:

- Experience with remote and hybrid work;
- Work productivity;
- Employee satisfaction;
- Work–life balance;
- Communication effectiveness;
- Organizational engagement;
- Managerial challenges.

The collected data were analyzed using descriptive statistical methods, which enabled the identification of the main trends in respondents' evaluations and perceptions.

The methodological approach of the study is consistent with practices commonly applied in the field of organizational behavior, where quantitative research instruments are widely used to assess employee experiences and attitudes (Gajendran & Harrison, 2007).

According to the research findings, remote work is primarily perceived by employees in the banking sector as a flexible work arrangement that enhances time-management capabilities and reduces daily operational costs.

Respondents' evaluations indicate that one of the main advantages of remote work is greater flexibility in work schedules. Employees particularly value the reduction of commuting time and the opportunity to achieve a better balance between professional and personal life.

At the same time, the study revealed several limitations associated with remote work environments. Respondents identified communication difficulties, reduced team interaction, and the potential weakening of organizational connections as significant challenges.

This issue is particularly important in the banking sector, where coordination, security, and rapid information exchange are of high importance. Therefore, remote work requires well-developed digital infrastructure and clearly defined communication policies.

When evaluating the hybrid work model, respondents noted that this approach better combines flexibility with opportunities for team collaboration. The hybrid model allows employees to

maintain the benefits of remote work while periodic face-to-face meetings contribute to preserving organizational culture and strengthening team relationships.

The findings of the study demonstrate that remote and hybrid work models have a significant impact on employees within the Georgian banking sector. Remote work enhances flexibility, improves time-management opportunities, and supports work–life balance; however, it also creates challenges related to communication, social integration, and organizational engagement. According to respondents' assessments, the hybrid work model represents a more balanced approach, as it combines the flexibility of remote work with the advantages of face-to-face collaboration. The study also confirms that the effectiveness of a work model depends not only on technological capabilities but also on organizational culture, managerial approaches, and the level of employee autonomy.

Based on the findings of the study, the following recommendations are proposed:

- Organizations should develop clear policies for remote and hybrid work arrangements;
- Results-oriented management systems should be further developed;
- Digital communication and cybersecurity mechanisms should be strengthened;
- Managers should develop competencies for effectively leading hybrid teams;
- Equal employee engagement should be ensured regardless of the chosen work arrangement.

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A Recovery Reversal or a Visa-Policy Response? Chinese Destination Allocation across Thailand, Japan and South Korea

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Abstract: This short conference version examines Thailand's temporary visa exemption for Chinese tourists from September 25, 2023 to February 29, 2024. The article asks whether the policy window was associated with a change in Thailand's relative allocation among Chinese travelers after accounting for origin recovery, destination recovery, persistent bilateral differences, and the adverse pre-policy China-Thailand trajectory. Using official monthly arrival data for Thailand, Japan and South Korea, the study estimates a comparative interrupted-trend difference-in-difference-in-differences design. The standard unadjusted benchmark is negative, while the interrupted-trend share estimate is positive across alternative trend windows. The evidence supports a cautious interpretation: the temporary visa exemption period is associated with a destination-allocation break, not a clean estimate of visa exemption alone or a broad claim of net tourism creation.

Keywords: visa exemption; mobility frictions; destination choice; Chinese outbound tourism; difference-in-differences; tourism recovery

1. Introduction

Visa facilitation is often used as a fast tourism-recovery instrument. By removing application steps, waiting time and approval uncertainty, a visa exemption can make a destination easier to choose before travelers commit money and time. Yet the effect is difficult to isolate during a post-pandemic reopening period. Tourist arrivals may change because the origin market is recovering, because air capacity is returning, because competitor destinations are becoming more or less attractive, or because policy barriers have changed. For that reason, a before-and-after rise in arrivals cannot by itself identify a visa-policy response.

Thailand's temporary visa exemption for Chinese tourists offers a useful case. The policy began on September 25, 2023 and ended on February 29, 2024, immediately before a separate Thailand-China mutual visa-exemption regime began on March 1, 2024. China was a major source market for Thailand, while Japan and South Korea were also rebuilding Chinese inbound tourism. China's resumption of outbound group tours to Japan and South Korea in August 2023 further complicates a Thailand-only evaluation.

The central question is therefore not whether Chinese arrivals to Thailand changed in raw terms after September 2023. It is whether Thailand gained relative allocation among Chinese travelers after broader origin recovery and competing destination dynamics are taken into account. The article treats the visa exemption as a reduction in destination-specific mobility friction, but it does not assume that the Thai policy can be separated from every adjacent reopening shock. The estimand is a policy-window-associated allocation break within the observed destination set.

The contribution is methodological and substantive. Methodologically, the study reframes a short visa-policy episode as a relative destination-choice problem and uses a cross-destination counterfactual rather than a Thailand-only event comparison. Substantively, it shows that the

clearest signal is not broad market recovery but Thailand's position within a three-destination Chinese outbound tourism set.

2. Theory and Hypotheses

Destination choice is comparative. Travelers decide whether to travel, where to travel, when to travel, and how much administrative uncertainty they are willing to accept. Visa requirements enter this process as pre-entry mobility frictions: they impose documentation costs, time costs, approval risk and reduced flexibility. Prior research on visa restrictions and tourism demand shows that such frictions can shape bilateral travel, while also warning that visa regimes are not randomly assigned and must be evaluated with careful counterfactuals (Neumayer, 2010; Artal-Tur et al., 2016; Pham et al., 2018; Rossello and Santana-Gallego, 2024).

The same logic is especially relevant after COVID-19. Tourism recovery was uneven across origins, destinations and supply constraints, so raw arrival rebounds mix demand recovery, policy rules, aviation capacity, traveler confidence and destination competition (Gossling et al., 2020; Song and Li, 2008; Zheng et al., 2025). A visa exemption can lower one component of generalized travel cost, but the realized response may be limited by flight supply, prices, tour products and safety perceptions.

Two margins follow. The first is travel creation: a traveler who would not otherwise have traveled internationally may decide to travel because the policy lowers the total cost of the trip. The second is destination reallocation: a traveler who was already considering an outbound trip may switch toward the destination with lower administrative friction. Travel creation is closer to arrival recovery relative to a historical benchmark. Destination reallocation is closer to a destination's share within a defined choice set.

H1 (secondary). After accounting for origin-wide tourism recovery, destination-wide tourism recovery, and time-invariant origin-destination differences, Thailand's temporary visa exemption is associated with an incremental increase in Chinese tourist arrivals to Thailand relative to other origin-destination pairs.

H2 (primary). During the temporary visa-exemption period, Thailand's included-destination share among Chinese arrivals across Thailand, Japan and South Korea increases relative to its pre-policy trajectory and relative to the corresponding destination allocation of comparison origins.

RQ1. Does the incremental China-Thailand response appear immediately, emerge with a delay, or weaken during the five full treatment months?

3. Data and Method

The unit of analysis is the origin-destination-month. The panel combines official monthly arrival statistics from Thailand's Ministry of Tourism and Sports, the Japan National Tourism Organization, and the Korea Tourism Organization Data Lab. The main sample covers January-August 2023 and October 2023-February 2024. September 2023 is excluded because the Thai policy began on September 25 and therefore contains only partial exposure. The sample stops in February 2024 because the mutual Thailand-China visa exemption began on March 1, 2024.

Comparison origins are screened conservatively. India and Taiwan received Thai visa exemptions during the treatment period and are excluded from the strict confirmatory sample. Origins affected by temporary South Korean K-ETA exemptions are also excluded. The strict recovery sample contains China, Indonesia, Malaysia, the Philippines and Vietnam across Thailand, Japan and South Korea, giving 195 observations. A broader level-arrival sample excluding India is used only as a supporting sensitivity check.

The primary outcome is included-destination share. For each origin-month, arrivals to each destination are divided by that origin's total arrivals across Thailand, Japan and South Korea. The China-Thailand value therefore measures Thailand's share of Chinese arrivals within the three-destination set, not Thailand's share of all Chinese outbound tourism. The secondary outcome is

recovery log, defined as log current arrivals plus one minus log same-month 2019 arrivals plus one. A supporting outcome uses log current arrivals plus one.

Design summary. The policy window is Thailand's temporary visa exemption for Chinese tourists, with October 2023-February 2024 treated as full exposure months. The main sample contains China plus Indonesia, Malaysia, the Philippines and Vietnam across Thailand, Japan and South Korea. The primary outcome is Thailand's included-destination share among Chinese arrivals in the three-destination set. The main model is a comparative interrupted-trend DDD with origin-month, destination-month and origin-destination fixed effects. Inference is summarized through an assignment reference distribution over 15 eligible assignments.

The baseline DDD estimates the China-Thailand post-policy term in an origin-destination-month panel: $y_{odt} = \beta(\text{China}_o \times \text{Thailand}_d \times \text{Post}_t) + \alpha_{ot} + \delta_{dt} + \gamma_{od} + \epsilon_{odt}$. Origin-month fixed effects absorb shocks common to all destinations for a given origin-month; destination-month fixed effects absorb shocks common to all origins visiting a given destination-month; origin-destination fixed effects absorb persistent bilateral differences.

A conventional pre-versus-post DDD is reported but not treated as the main specification because Thailand's China share fell sharply before treatment. The preferred model adds a China-Thailand pre-policy trend and interprets the post coefficient as a break from that trajectory. This comparative interrupted-trend DDD does not solve every problem. It makes the counterfactual explicit and requires the result to be read as conditional on the pre-trend projection.

Because the design has one treated origin-destination pair, conventional robust standard errors are reported only as diagnostics. The main inferential reference is an assignment distribution over 15 eligible origin-destination assignments in the strict recovery panel, including the actual China-Thailand assignment and 14 placebo assignments. This procedure ranks how unusual the observed estimate is within the stated assignment set; it does not imply that policy assignment was random.

4. Results

The descriptive allocation path reveals the identification problem. Thailand's share of Chinese arrivals within the three-destination set fell from 62.0 percent in January 2023 to 36.3 percent in August 2023. This decline is consistent with Japan and South Korea recovering as destinations and with China's August 2023 resumption of outbound group tours to those countries. A simple before-and-after comparison would therefore compare treatment months with a pre-period that includes much higher early-2023 Thailand shares.

For the primary included-destination-share outcome, the unadjusted post-policy DDD coefficient is -0.107, or a 10.7 percentage-point decline. This benchmark does not support a simple positive visa-exemption effect and shows why the observed pre-policy trajectory must be modeled. After adding the China-Thailand trend term using the January-August 2023 pre-period, the coefficient becomes 0.357, or a 35.7 percentage-point allocation break.

This magnitude is a counterfactual contrast, not a raw post-policy increase. The observed China-Thailand share was 36.5 percent in October 2023, 39.3 percent in November, 42.9 percent in December, 42.2 percent in January 2024 and 45.6 percent in February. Under the January-August no-break trend, the fitted counterfactual is much lower. The coefficient therefore means that Thailand's relative allocation did not continue along the steep pre-policy decline.

The secondary recovery outcome is weaker. For recovery log, the unadjusted post-policy DDD coefficient is -0.403, equivalent to about -33.2 percent. The interrupted-trend coefficient is 0.247, equivalent to about 28.1 percent, but its assignment-reference evidence is less favorable than the share outcome. Supporting level-arrival checks show the same sign reversal but are not the main evidentiary basis.

Results summary. The unadjusted share DDD is -0.107, or -10.7 percentage points, while the January-August interrupted-trend estimate is 0.357, or 35.7 percentage points, and ranks first among 15 eligible assignments (right-tail probability = 0.067). Alternative pre-trend windows give positive share estimates from 0.130 to 0.406; August-excluded checks give 0.238 and 0.272. The recovery-log estimate is weaker, with a trend-adjusted coefficient of 0.247 and right-tail probability of 0.200. The logit-share check gives an odds ratio of 7.26, and leave-one-control-origin-out estimates range from 0.329 to 0.375.

5. Discussion

The evidence is clearest for destination allocation, not for broad recovery. The unadjusted DDD benchmark is negative because Thailand's relative China share was already declining before the policy window. Once the model allows for that adverse path, the primary share estimate becomes positive and ranks first within the eligible assignment set. The result is therefore best read as a policy-window-associated allocation break.

This finding differs from a Thailand-only event-study interpretation in its estimand. The question is not only whether Chinese arrivals to Thailand changed after the policy. It is whether the China-Thailand pair stands out after China-wide recovery, destination-wide recovery, persistent bilateral differences, competitor-destination shocks and the pre-policy allocation trend are made explicit. The cross-destination counterfactual is the main added value.

For tourism policy, the implication is practical. Arrival totals remain necessary, but they are not enough when neighboring destinations recover at different speeds. Visa-facilitation dashboards should pair raw arrivals with destination-allocation shares, recovery benchmarks, competitor policy calendars, air-capacity indicators and source-market sentiment. If the aim is market expansion, visa facilitation needs support from flights, tour products and demand-side communication. If the aim is competitive positioning, allocation metrics should be part of evaluation from the start.

6. Limitations and Conclusion

The main limitation is the bounded denominator. The included-destination share measures Thailand's share of Chinese arrivals across Thailand, Japan and South Korea; it does not measure Thailand's share of all Chinese outbound tourism. The denominator is defensible because the three destinations provide harmonized official monthly origin data, but the interpretation remains bounded.

A second limitation is the one-treated-pair structure. The assignment distribution is more appropriate than relying only on conventional robust standard errors, but the number of eligible assignments is small and the placebo assignments are not perfectly exchangeable with China-Thailand. The smallest possible right-tail probability in the strict panel is 0.067.

A third limitation is the short and unstable pre-period. The January-August 2023 baseline was shaped by rapid reopening, changing air capacity and China's August 2023 resumption of group tours to Japan and South Korea. The interrupted-trend specification addresses this instability by modeling the adverse China-Thailand trajectory, but it cannot fully separate the Thai visa window from competitor-destination reopening.

In conclusion, Thailand's temporary visa exemption for Chinese travelers is associated with a positive relative destination-allocation break after the pre-policy trajectory is modeled. The result supports a cautious visa-policy response interpretation, especially for destination choice, but it does not justify a broad claim that the exemption alone created net tourism recovery. In short-window reopening contexts, visa facilitation should be evaluated against a credible counterfactual and against the competitive choice set in which travelers actually decide.

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Digital Transformation and Disclosed Supply-Chain Quality Capability in Chinese Manufacturing: An Audited Annual-Report Study

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Abstract. This study examines whether digital transformation is associated with supply-chain quality capability (SCQC) as disclosed in annual reports of Chinese listed manufacturers. The study develops SCQC_v2, a context-filtered annual-report measure that retains references to implemented supplier-quality, certification, inspection, traceability, and process-control routines while excluding financial notes, generic slogans, future plans, and unrelated quality language. Using a 2010-2024 A-share manufacturing panel, firm fixed-effects models show a positive same-year association between digital-transformation disclosure and disclosed SCQC. In the preferred specification, which controls for annual-report length and removes the sparsely observed patent control, the association remains positive but modest. It is not stable after firm-specific trends or lagged digitalization are introduced, and accounting-based digital-intangible-asset measures do not reproduce the result. The contribution is therefore both methodological and substantive: annual-report dictionaries should be treated as audited measurement instruments, and the evidence supports a contemporaneous disclosure relationship rather than a causal investment-to-capability claim. The findings direct attention to supplier and process-quality routines as an operational setting in which digital transformation becomes visible.

Keywords: digital transformation; supply-chain quality capability; annual-report text analysis; measurement audit; Chinese listed manufacturing firms

1. Introduction

Digital transformation is operationally consequential when data enter supplier qualification, inspection records, defect tracing, process control, and corrective action. These routines connect purchasing, production, logistics, suppliers, and customers. They provide a concrete setting for studying digital transformation beyond broad firm-level outcomes such as performance or innovation. This study asks whether firms that disclose more digital transformation also disclose more concrete supply-chain quality routines in their annual reports.

The focal construct is supply-chain quality capability (SCQC): coordinated quality work within the firm and across supply-chain partners. In public reports, SCQC appears in descriptions of supplier qualification, quality-system certification, inspection, traceability, process control, defect prevention, and corrective action. These disclosures are informative but do not directly observe supplier audits, defect rates, or realized product quality. The article therefore treats SCQC as a disclosed-capability proxy and makes the measurement boundary explicit.

The paper makes two contributions. First, it develops an auditable text measure rather than relying on an unexamined keyword count. The initial dictionary was designed to retrieve relevant quality language, but manual coding showed that it also captured accounting notes, environmental disclosure, customer-qualification statements, future plans, and generic slogans. SCQC_v2 uses this error record to filter context around keyword hits before the measure enters regression analysis. Second, using the audited proxy, the paper tests whether digital-

transformation disclosure and disclosed SCQC move together within firms over time. The empirical claim is intentionally narrow: it concerns annual-report disclosure, not causal conversion from digital investment into realized quality capability.

2. Theoretical Background and Hypothesis

Resource-based and dynamic-capability perspectives locate the value of digital technology in the routines it changes rather than in the technology alone (Barney, 1991; Teece, Pisano, and Shuen, 1997). Digital systems can increase the visibility of supplier performance, inspection results, and production deviations; they can also standardize records and make traceability and corrective action more repeatable. Digital-transformation research similarly emphasizes organizational change, coordination, and implementation conditions rather than a direct technology-to-performance path (Bharadwaj et al., 2013; Vial, 2019; Verhoef et al., 2021).

Supply-chain quality management extends quality work beyond the focal plant to supplier assessment, information sharing, process integration, and corrective action (Robinson and Malhotra, 2005; Foster, 2008; Kaynak and Hartley, 2008). These practices are more specific than general product-quality claims. When digital systems become embedded in such routines, firms have stronger opportunities to document qualification, inspection, traceability, and process-control work in their annual reports.

The theoretical mechanism is therefore operational: digital systems can improve visibility, standardization, traceability, and the repeatability of corrective action. Annual-report text observes the disclosure layer of this process. It cannot establish that all reported digital spending is embedded in quality routines or that the routines cause later performance. The study tests the following hypothesis: H1: Annual-report digital-transformation disclosure is positively associated with disclosed supply-chain quality capability.

3. Data, Measures, and Measurement Audit

The study uses Chinese A-share manufacturing firms from 2010 to 2024. After standard exclusions, the listed-firm panel contains 40,799 firm-year observations for 3,885 firms. The annual-report corpus covers 2009-2024 and provides 56,301 firm-year SCQC records; 32,022 observations merge into the manufacturing panel. Firm-level data provide industry classifications, financial statements, ownership and governance variables, innovation indicators, intangible assets, audit variables, internal-control variables, and standard controls.

Digital transformation is measured primarily by *Indt_wu*, the natural logarithm of one plus the frequency of 76 annual-report terms related to artificial intelligence, big data, cloud computing, blockchain, and digital applications (Wu et al., 2021). An alternative Zhao text index captures digital technology applications, internet business models, intelligent manufacturing, and modern information systems (Zhao, Wang, and Li, 2021). Two accounting measures—capitalized digital intangible assets and their share of total intangible assets—are retained as non-text comparisons. They represent recognized investment rather than digital discourse.

SCQC_v2 is the natural logarithm of one plus the annual-report count of cleaned SCQC keyword hits. The underlying dictionary covers quality management, supplier quality, certification and standardization, traceability and reliability, and inspection, process control, and defect prevention. For each hit, a fixed context window is examined. The rule retains passages describing concrete quality management, supplier quality, certification, inspection, production-process, or procurement-quality practices. It excludes financial disclosure, glossary or biography language, safety or environmental disclosure, customer qualification, future plans, and generic slogans. A count per 10,000 Chinese/English characters is used as a robustness outcome.

The audit reports both reliability and transfer limits. In the 2018-2024 calibration sample, coder agreement was 95.0% and Cohen's kappa was 0.895; the error-informed rule reached 84.3% strict precision and 58.1% recall when backtested on the same snippets. In a separate 2009-2017 blind holdout, agreement remained high (97.0%; kappa = 0.927), while strict precision and recall

fell to 60.9% and 50.9%, respectively. A further 300-snippet stress sample showed that difficult passages cluster around generic, future-oriented, supplier-quality, and inspection-process language. These results support use of the proxy while making its boundary and temporal sensitivity visible.

4. Empirical Strategy and Results

The main model estimates $SCQC_{it} = \beta Digital_{it} + \theta X_{it} + \text{firm fixed effects} + \text{year fixed effects} + \text{error}$. Controls include firm size, leverage, profitability, intangible-asset ratio, gross margin, inventory intensity, receivables intensity, payables intensity, R&D intensity, and patent stock where available. Standard errors are clustered by firm. The model compares each firm with itself over time and therefore removes time-invariant firm characteristics, while year fixed effects absorb common shocks. It remains an associational design.

Table 1 reports the core tests. The full-control model is positive but uses fewer observations because patent coverage is limited. The preferred expanded-sample model omits patent stock and adds annual-report length. Its coefficient is 0.0217 (SE = 0.0095; $p = 0.0226$), corresponding to a 2.85% one-standard-deviation association in $SCQC_{v2}$. The result also remains positive with the density outcome and with industry-by-year fixed effects. The alternative Zhao text index is positive in the report-length specification. In contrast, capitalized digital intangible assets are insignificant, the intangible-asset ratio is negative, and the $Indt_wu$ association is not statistically significant after firm-specific linear trends or one-year-lagged digitalization are introduced.

Table 1. Core digital-transformation and disclosed-SCQC estimates

Specification	Key variable	Coefficient (SE)	p-value	N
Firm + year FE; full controls	Indt_wu	0.0554 (0.0111)	<0.001	19,860
Firm + year FE; no patent control	Indt_wu	0.0395 (0.0097)	<0.001	30,714
Preferred: firm + year FE + report length	Indt_wu	0.0217 (0.0095)	0.0226	30,714
Firm + year FE; SCQC density	Indt_wu	0.0253 (0.0082)	0.0022	30,714
Firm trends + year FE + report length	Indt_wu	0.0129 (0.0086)	0.1304	30,714
Firm + year FE + report length	Lagged Indt_wu	0.0132 (0.0096)	0.1660	27,505

Note. Standard errors are clustered by firm. The preferred model controls directly for $\ln(1 + \text{Chinese/English character count})$. All estimates are drawn from the author-provided manuscript.

The pattern supports H1 only as a contemporaneous disclosure relationship. Digital-transformation language and SCQC language rise together within firms after report length and industry-year shocks are considered. The attenuation under firm trends and lagged digitalization, together with the divergence from accounting measures, rules out a simple reading in which digital investment mechanically creates quality capability. The result is strongest when both constructs are observed as annual-report text.

5. Discussion and Conclusion

The study brings digital-transformation research closer to supplier and process-quality routines. Its evidence is consistent with a practical mechanism: digital systems can make qualification, inspection, traceability, and corrective action more visible and more standardized. Yet the results also show why digital transformation should not be treated as a single interchangeable construct. Digital discourse, recognized investment, and operational embedding capture different layers of organizational change.

The methodological implication is equally important. A dictionary proxy should not enter panel analysis merely because coders agree on a sample or because the term list appears plausible. Researchers should document false-positive sources, precision and recall, sensitivity to report length, temporal transfer, and the relationship between text measures and adjacent non-text evidence. SCQC_v2 is useful precisely because its limits remain visible: it measures disclosed routines, not directly observed audits, defect rates, or realized product quality.

Three limitations delimit the contribution. First, annual reports observe disclosure rather than operational performance. Second, the same-year association can reflect shared reporting dynamics, managerial attention, omitted organizational change, or co-development of digital and quality routines. Third, the decline in precision on the historical holdout indicates that language-based rules require periodic revalidation. Future research should link annual-report measures to supplier audits, certifications, defect rates, digital-infrastructure shocks, and firm-product-destination customs records.

In conclusion, the evidence shows that digital-transformation disclosure and disclosed supply-chain quality capability co-move within Chinese manufacturing firms, but the relationship is most defensible as a same-year disclosure finding. The paper's broader lesson is that annual-report dictionaries become credible organizational measures only when their errors, transfer limits, and interpretive scope are made explicit.

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Digital Transformation Disclosure and the Visibility-Capability-Conversion Gap in Supply-Chain Quality Commitments: Evidence from Chinese Listed Manufacturing Firms

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Abstract

Digital transformation and quality-related disclosures are often used to infer manufacturing capability, yet public visibility is not the same as verified capability or market conversion. This study develops a visibility-capability-conversion framework for supply-chain quality commitments and tests it with a 2010-2024 panel of Chinese A-share listed manufacturing firms. Digital transformation, intelligent manufacturing orientation and quality-commitment visibility are measured from annual-report text, and overseas outcomes are examined with firm and year fixed effects. The results show that digital transformation disclosure and supply-chain quality-commitment visibility co-move in public reports, but this visibility does not function as a stand-alone signal of subsequent overseas revenue, overseas revenue share or export-market survival. An exploratory verification-related production-quality infrastructure proxy suggests a narrower boundary: quality-commitment visibility accompanied by more concrete verification-related language is associated with overseas gross margin, not with revenue-scale conversion. The paper contributes a disclosure-based measurement audit for interpreting digital and quality text signals in manufacturing research.

Keywords: digital transformation; intelligent manufacturing; supply-chain quality commitments; quality standards; disclosure-based measurement audit; Chinese listed firms

1. Introduction

Digital transformation has become a central feature of manufacturing upgrading. Firms increasingly use digital technologies, intelligent manufacturing systems and data-intensive management practices to coordinate production, document processes and communicate operational priorities to external audiences. In manufacturing, this transformation is often discussed together with quality competition: firms are expected not only to produce efficiently, but also to demonstrate that their products and processes meet credible quality-control and quality-standard expectations.

The link between digital transformation and quality competition is more difficult to establish than the managerial narrative suggests. Digital disclosure may reflect process codification, traceability and information transparency, but these features are not the same as implemented production capability. Likewise, visible quality commitments may reflect a real organizational basis, but they may also reflect reporting style, disclosure incentives or co-evolving managerial attention. A quality commitment can function as a signal only when external audiences view it as credible, relevant and tied to verifiable operations.

This paper asks whether digital transformation and intelligent manufacturing orientation are associated with the public visibility of quality-control and quality-standard commitments, and whether this visibility is accompanied by subsequent overseas market outcomes. The focal construct is supply-chain quality-commitment visibility (SCQC visibility): the degree to which a firm makes quality-control routines, quality-standard commitments, inspection or certification references and continuous-improvement claims observable in annual reports. The construct is deliberately defined as a disclosure layer, not as direct product quality or audited operational capability.

Empirically, the study uses a 2010-2024 panel of Chinese A-share listed manufacturing firms. The base sample contains 32,022 firm-year observations from 3,668 firms after retaining observations with valid listed-firm stock identifiers. Digital transformation and intelligent manufacturing are measured with annual-report text proxies. SCQC visibility is measured with cleaned text indicators of quality-control and quality-standard commitments. Overseas market outcomes include overseas revenue scale, overseas revenue ratio, overseas income presence and export-related persistence measures.

The central finding is a visibility-capability-conversion gap rather than a simple digitalization-performance pathway. Digital transformation disclosure and SCQC visibility are observable together in public reports, but SCQC visibility does not become a self-sufficient signal of overseas revenue scale, overseas revenue share or export market survival. A verification-layer extension sharpens the argument: verification-related quality infrastructure language does not turn SCQC visibility into a revenue-scale signal, but the interaction between SCQC visibility and the verification proxy is positively associated with one-year-ahead overseas gross margin.

2. Conceptual Framework and Research Expectations

Prior research supports the need to separate disclosure, capability and conversion. Digital transformation studies emphasize organizational change, resources, capabilities and implementation conditions rather than treating technology language as a direct performance mechanism [1,2]. Evidence on intelligent manufacturing among Chinese listed manufacturing firms shows that stronger operational treatment can be linked to productivity under a quasi-experimental design, but it does not by itself test quality-commitment visibility or overseas quality competitiveness [3]. Supply-chain quality management research also treats supplier quality, cross-firm process integration, inspection, incentives and performance as related but separable constructs [4,5].

The study therefore uses a three-stage framework. Stage 1 is visibility formation: digital disclosure and intelligent-manufacturing orientation may be associated with whether firms make quality-control and quality-standard commitments observable. Stage 2 is capability verification: visible commitments must be connected to verifiable production-quality infrastructure before they can become credible capability signals. Stage 3 is market conversion: capability must be recognized by external markets before it appears in overseas revenue, revenue share, export persistence or margin outcomes.

This framework reflects a measurement-audit logic. Annual-report text can contain economically relevant information, but dictionary choice, document genre and textual comparability must be audited rather than assumed [6,7]. Signaling theory further implies that disclosure becomes informative only when audiences view the signal as credible, costly or verifiable [8]. In international markets, product quality and export outcomes also reflect demand, price, distribution, productivity and market selection as well as quality itself [9,10]. Overseas revenue is therefore an outcome related to quality competitiveness, not a pure measure of quality.

Two expectations guide the visibility-formation test. First, firms with stronger disclosed digital transformation orientation should be more likely to make quality-control and quality-

standard commitments visible, because digital systems can support process documentation, traceability and managerial reporting. Second, intelligent manufacturing orientation should be related to SCQC visibility because it is closer to production processes, equipment coordination and quality-control routines than general digital-transformation language. Both expectations are associational, not causal capability claims.

The downstream question is more open. If SCQC visibility is trusted by external audiences, it may be accompanied by stronger overseas market outcomes. If the visibility is generic or insufficiently verified, it may not convert. The paper therefore asks whether public quality-commitment visibility converts into subsequent overseas market outcomes and whether verification-related production-quality infrastructure language changes this relationship.

3. Data and Methods

The empirical setting is Chinese A-share listed manufacturing firms observed from 2010 to 2024. The analysis is conducted at the firm-year level and combines annual reports, firm financial information, overseas revenue disclosures, export-related persistence variables, trade-policy exposure measures and standard financial controls. Model-specific samples vary because lagged variables, overseas outcomes and controls have different coverage.

Digital transformation is measured with annual-report text proxies. The primary proxy is the Zhao dictionary measure, used in one-year lagged form in the main models. The alternative proxy is a logged Wu dictionary measure. Intelligent manufacturing orientation is measured with a production-oriented annual-report text proxy. These variables capture disclosed orientation and salience, not directly verified technological implementation.

SCQC visibility is measured by a cleaned text indicator of quality-control and quality-standard commitments. The cleaning logic distinguishes quality-control systems and routines, quality-standard commitments, certification or audit visibility and continuous-improvement language. It excludes generic quality adjectives when they do not indicate a process, standard, inspection, certification or commitment. The logged cleaned count is the primary measure because the binary indicator is saturated in the base panel and the density measure may over-adjust substantive visibility in short reports.

Overseas market outcomes are measured with one-year-ahead logged overseas revenue, overseas revenue ratio and export market survival. The verification-layer extension adds a disclosure-based verification-related production-quality infrastructure proxy (VPQI visibility proxy). It combines supplier-quality, certification or standard, traceability or reliability and inspection or process language. Because VPQI is still constructed from public text, it is not treated as external certification, customer-audit evidence or directly observed production capability.

The main specifications use firm and year fixed effects with firm-clustered standard errors. They include firm controls and, in overseas outcome models, lagged outcome controls where appropriate. The design supports associational interpretation. Firm fixed effects absorb time-invariant firm heterogeneity and year fixed effects absorb common macro shocks, but time-varying omitted variables, disclosure selection and co-evolution between digital transformation and quality commitment visibility remain important concerns.

4. Results

The descriptive evidence shows broad public visibility of quality commitments among listed manufacturing firms. In the base sample of 32,022 firm-year observations, the logged SCQC visibility measure has a mean of 2.397 and a standard deviation of 0.909, while the binary indicator has a mean of 0.970. The empirical variation therefore comes less from whether firms ever mention quality commitments and more from differences in the intensity and form of such visibility.

The first set of models examines whether digital transformation and intelligent manufacturing are associated with SCQC visibility. The one-year-lagged Zhao digital

transformation proxy is positive in the main specification, with a coefficient of 1.0221 and a p-value of 0.1028. The alternative Wu proxy is not supportive. The intelligent manufacturing proxy is also positive, with a coefficient of 0.0007 and a p-value of 0.1051. These estimates are directionally consistent with visibility formation, but they should be described as associational and near conventional thresholds rather than as strong confirmatory evidence.

Robustness diagnostics support this cautious interpretation. The Zhao proxy remains positive under province-year fixed effects, excluding 2020-2021 and adding text-length adjustment. The corresponding p-values are close to, but just above, the 5 percent threshold. This pattern is consistent with disclosure co-movement between digital orientation and quality-commitment visibility, but it does not establish that digital transformation created verified quality capability.

Table 1. Condensed empirical evidence

Empirical link	Target estimate	p-value	Interpretation
Digital transformation -> SCQC visibility	L1_dt_zhao = 1.0221	0.1028	Positive but unresolved at the 5 percent level; consistent with disclosure co-movement.
Intelligent manufacturing -> SCQC visibility	L1_IM = 0.0007	0.1051	Positive but unresolved; supports cautious visibility-formation reading.
SCQC visibility -> overseas revenue	ln_SCQC = 0.0218	0.4626	Small and statistically unresolved; no stand-alone revenue-scale conversion.
SCQC visibility -> overseas revenue ratio	ln_SCQC = 0.0005	0.8858	No evidence that quality-commitment visibility predicts revenue share.
SCQC visibility -> export survival	ln_SCQC = -0.0003	0.9513	No support for export persistence conversion.
SCQC x VPQI -> overseas gross margin	interaction = 1.9520	0.0015	Verification-enhanced visibility is associated with a margin-related outcome.

The downstream conversion models provide the clearest evidence for the article's boundary claim. SCQC visibility does not predict one-year-ahead overseas revenue, overseas revenue ratio or export market survival. This result separates public quality-commitment visibility from foreign-market quality competitiveness. Visible commitments may be part of a disclosure and signaling process, but their market relevance depends on credibility, verification and external recognition.

The mechanism-consistency model also remains bounded. When lagged digital transformation and SCQC visibility jointly predict one-year-ahead overseas revenue, both coefficients are positive but statistically indistinguishable from zero. Boundary diagnostics using tariff exposure and an ex ante quality-sensitive industry indicator do not support stronger visibility-outcome relationships. Retaining these unsupported results is important because redefining subgroups after estimation would make the argument less credible.

The VPQI extension refines the interpretation. Lagged Zhao digital transformation and intelligent manufacturing are positively associated with VPQI visibility. However, the interaction between SCQC visibility and VPQI does not support revenue-scale conversion: the interaction is unresolved for overseas revenue and overseas revenue ratio, and it is negative for export market survival. The most informative result is the gross-margin model, where the SCQC-by-VPQI

interaction is positive and statistically distinguishable. Verification-enhanced visibility therefore appears closer to quality-premium or product-positioning conversion than to overseas market scale.

Temporal diagnostics caution against a one-directional causal story. Longer lags of digital transformation do not consistently predict SCQC visibility. A future digital transformation placebo predicts current SCQC visibility, and current SCQC visibility predicts one-year-ahead digital transformation. These diagnostics point to co-evolution or disclosure-capability confounding rather than a clean sequence from digital transformation to quality visibility to market conversion.

5. Discussion and Implications

The findings suggest that the critical link between disclosure visibility and market conversion is verification. Public quality commitments may increase the observability of a firm's production-quality orientation, but observability alone does not establish credibility. For visibility to become a capability signal, external audiences must be able to connect disclosed commitments to verifiable production-quality infrastructure, including inspection records, certification life cycles, customer audits, product traceability, defect-control systems and destination-market compliance records.

The VPQI diagnostic gives this argument a more concrete empirical form while keeping the construct boundary intact. Because VPQI is built from annual-report language, it cannot be treated as audited capability evidence. Even so, it separates generic SCQC visibility from more concrete verification-related infrastructure language. The pattern is theoretically useful: verification-enhanced visibility does not generate a broad revenue-scale effect, but it is associated with overseas gross margin, an outcome closer to quality-premium and product-positioning conversion.

For managers, the implication is that digital transformation should not be treated as a substitute for verifiable quality practice. Digital systems may help firms document and disclose quality commitments, but public visibility alone is unlikely to be enough. Firms seeking overseas market credibility should connect digital systems to auditable quality-control routines, certification evidence, customer-facing verification, product traceability and defect-control systems. The managerial task is not merely to mention quality standards more often, but to make quality commitments credible and useful to external audiences.

For policymakers, the results suggest that digital adoption, quality disclosure and realized quality competitiveness should be distinguished. Policies promoting intelligent manufacturing or digital transformation may help firms build operational foundations, but public quality commitment visibility is only one step in the conversion process. Export-upgrading policy should support mechanisms that connect digital systems with verifiable quality infrastructure, such as certification data, product traceability, standards participation records and credible inspection systems.

6. Limitations and Conclusion

This study has several limitations. First, SCQC visibility is not true latent quality capability. It captures public visibility of quality-control and quality-standard commitments in annual-report text, not whether firms implemented quality systems deeply or whether customers perceived their products as higher quality. Second, the VPQI visibility proxy is an exploratory disclosure-based extension, not third-party verification, customer-audit evidence or direct implementation depth.

Third, overseas outcomes are imperfect proxies for quality competitiveness. Overseas revenue, overseas revenue ratio, export persistence and overseas gross margin are influenced by many factors beyond quality. Fourth, the fixed-effect panel design remains associational. Firm and year fixed effects reduce some confounding, but time-varying omitted variables and disclosure selection remain. Future research should use product-level export quality, certification life-cycle

data, customer audit outcomes, product recall records, destination-market compliance outcomes or credible quasi-experimental shocks where available.

The study concludes that public digital and quality narratives are useful empirical signals, but they should not be overread. Digital transformation and quality-commitment visibility may co-evolve in public disclosures, yet visibility alone does not establish implemented quality capability or guarantee overseas market conversion. The verification-layer evidence adds a sharper boundary: verification-enhanced visibility is not a revenue-scale signal, but it is associated with overseas gross margin. Visibility requires verification before it can become capability, and capability requires market recognition before it can become conversion.

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Tourist privacy protection and data security: dual challenges and countermeasures of digital tourism management

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PhD

Abstract

With the deep penetration of digital technologies in the tourism industry, the online travel market continues to expand, and China's market size is expected to reach 1.8 trillion yuan by 2025. However, data security risks are rising simultaneously, with 57,092 data breach incidents reported in the global tourism sector during the first half of 2025, where third-party supply chain vulnerabilities accounted for 30%. This paper analyzes the current status of privacy protection, combines the latest enforcement cases of GDPR with the application of federated learning technology, and proposes a three-dimensional solution encompassing technical defense, management optimization, and regulatory adaptation to provide a compliant path for the digital transformation of tourism enterprises.

Keywords: Digital Tourism; Privacy Protection; Data Security; GDPR; Federated Learning

1. Development status of digital tourism

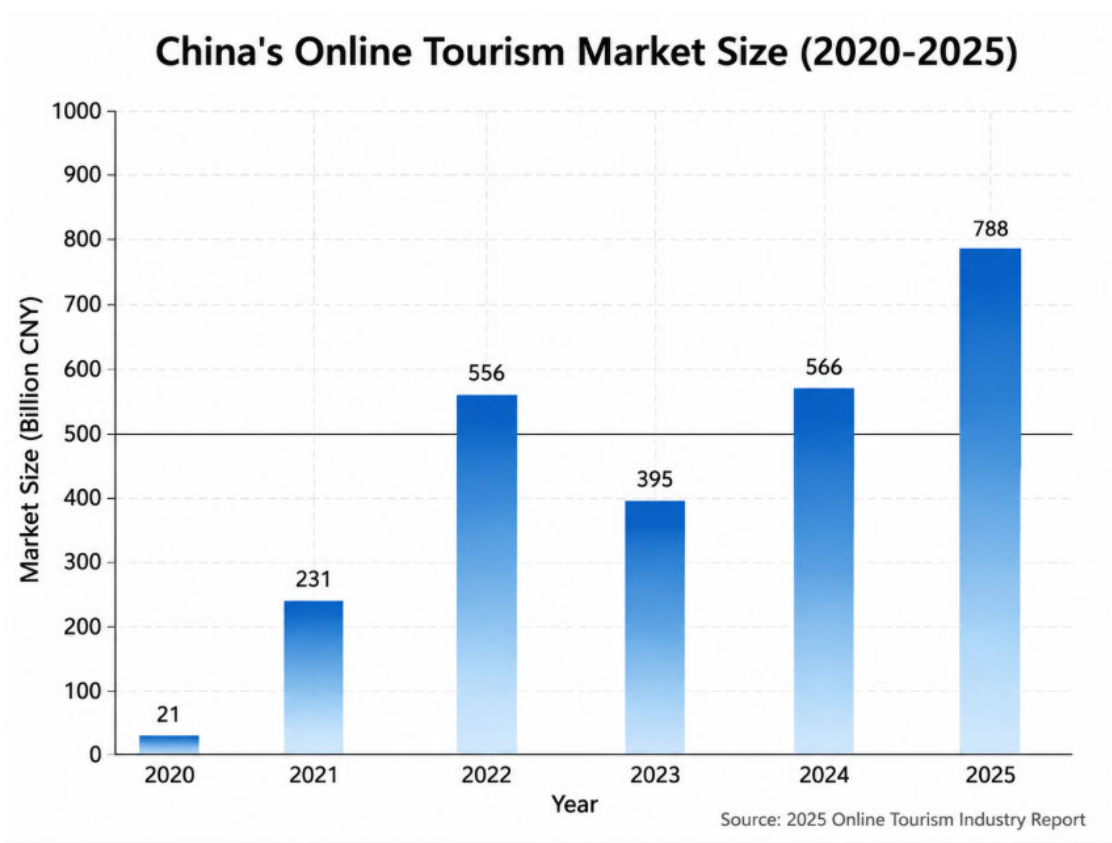
1.1 Market size and growth drivers

In 2025, the scale of China's online tourism market is expected to exceed 1.8 trillion yuan, with mobile bookings accounting for over 85%, and demand for personalized customization services increasing by 37% year-on-year. The market growth is mainly attributed to:

Technology-driven: AI recommendation systems increase booking conversion rates by 22% (Source: 2025 Online Travel Industry Report)

Policy support: The "New Digital Cultural Tourism Infrastructure" policy of the Ministry of Culture and Tourism has promoted the coverage rate of smart scenic spots to 68%

Consumption upgrade: Gen Z's share increased to 42%, and demand for immersive experiences such as VR live preview increased by 53%



Size of online travel market

1.2 Data application scenario expansion

Tourism enterprises optimize services through multi-dimensional data collection:

User portrait: integrate 23 types of labels such as travel preference and spending power

Dynamic pricing: real-time passenger flow data based on price fluctuations (up to 35%)

Safety monitoring: IoT devices in scenic spots generate 12TB of behavioral data per day

2. Privacy protection and data security challenges

2.1 Data breach risk situation

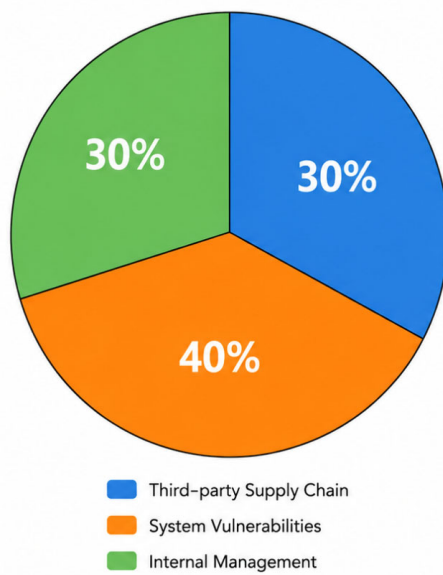
The data leakage in the tourism industry in 2025 presents three characteristics:

Supply chain attacks are normalized: The proportion of data leaks caused by third-party cooperation increased from 15% in 2024 to 30%, and a certain OTA platform leaked 12 million order information due to cloud storage configuration error

Cross-border transmission compliance risks: 38% of outbound tourism enterprises face compliance rectification due to the EU GDPR restrictions on cross-border data flows

Internal threats are prominent: 27% of leaks are caused by employee errors, 9 percentage points higher than the industry average

**Distribution of Data Leakage Causes
in the Tourism Industry (2025)**



Source: 2025 Online Tourism Industry Report

2025 Tourism data leakage pie chart

2.2 Case studies

2.2.1 GDPR Enforcement Upgrade

In April 2025, TikTok was fined \$600 million by the European Union for transmitting user data to the United States without explicit consent, setting a record for data penalties in the tourism industry. That same month, France's Data Authority imposed an €80,000 fine on CALOGA for violating the "dual opt-in" principle in its commercial email marketing practices.

2.2.2 Enterprise data security incidents

Marriott International: 131.5 million customers affected by 2024 data breach, paid \$52 million settlement

Aeroflot: Shares fell 7.2% in July 2025 after a system breach led to the leakage of 39 million passenger PII data

3. Construction of technical defense system

3.1 Application of federated learning in user portrait

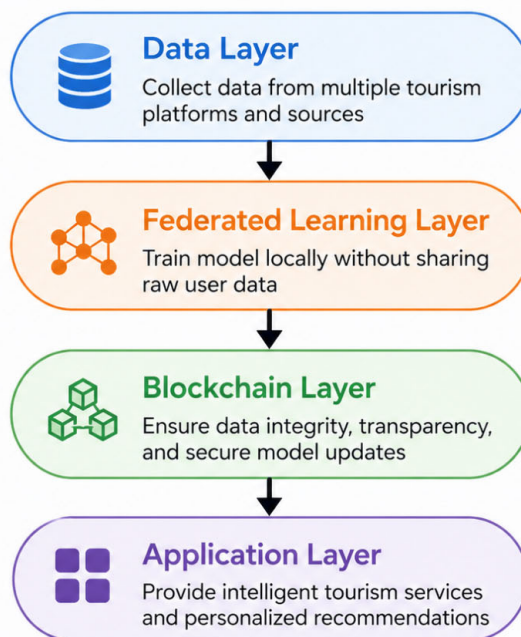
Temu platform realizes cross-regional data collaborative training through federated learning technology, without sharing the original data:

Personalized recommendation accuracy increased by 37%

42% reduction in data compliance costs

A 65% drop in user privacy complaints

Federated Learning Application Architecture in Tourism User Profiling



Source: 2025 Online Tourism Industry Report

Federal Learning Application Architecture

3.2 Application of blockchain electronic contract

After the introduction of blockchain technology by a top OTA platform:

Contract tampering risk reduced to zero

Dispute resolution cycle reduced from 72 hours to 4 hours

Storage costs reduced by 60%

4. Management optimization strategies

4.1 Data classification and hierarchical management

It is suggested that tourism enterprises implement a three-level classification mechanism:

Primary data (payment information, biometrics): encrypted and stored using SM4 national secret

Secondary data (travel records, consumption preferences): desensitized for data analysis

Tier 3 data (open evaluation, attraction information): can be used for marketing promotion

4.2 Supply chain security governance

Establish the "three reviews and three checks" mechanism:

1. Access review: Third-party service providers are required to pass ISO/IEC 27701 privacy certification

2. Process audit: Data security assessment conducted quarterly

3. Emergency supervision: establish a 24-hour response channel

5. Regulatory adaptation and compliance path

5.1 Comparison of domestic and foreign regulations

Compliance dimension	GDPR ask	China's Data Security Law requires
Cross-border data	Need to go through SCC or Binding Corporate Rules	Key data needs security assessment before going out
User rights	The right to carry and delete the contained data	Increase the right to correct data and withdraw consent
Penalty strength	It is the highest in the world at 4% of revenues	The maximum fine is 50 million yuan

5.2 Compliance implementation steps

1. Distance analysis: evaluated against the Data Security Capability Maturity Model for Information Security Technology (GB/T 37988-2019)
2. Implementation of the remediation: focus on improving the data security impact assessment (DPIA) process
3. Continuous monitoring: deploy a log audit system to save audit records for at least 6 months

6. Conclusion

The rapid advancement of digital technologies has fundamentally transformed the tourism industry, creating new opportunities for service innovation, operational efficiency, and personalized customer experiences. Technologies such as artificial intelligence, big data analytics, cloud computing, blockchain, and the Internet of Things have enabled tourism enterprises to provide more intelligent and convenient services while improving destination management and business competitiveness. However, the increasing dependence on digital platforms has also resulted in significant challenges regarding tourist privacy protection and data security. As tourism organizations collect, process, and exchange large volumes of personal information, ensuring data confidentiality, integrity, and regulatory compliance has become a critical issue for both enterprises and policymakers.

This paper systematically examined the major privacy and cybersecurity challenges associated with digital tourism management. The analysis showed that excessive personal data collection, third-party supply chain vulnerabilities, cross-border data transmission, cloud service security risks, and increasingly sophisticated cyberattacks have become the primary threats facing the tourism industry. Representative international cases further demonstrate that insufficient data governance may lead to substantial financial losses, legal liabilities, reputational damage, and declining consumer trust. Therefore, privacy protection should no longer be regarded merely as a legal obligation but as an essential component of sustainable digital tourism development.

To address these challenges, this study proposed an integrated governance framework combining technological innovation, organizational management, and regulatory compliance. From a technological perspective, privacy-enhancing technologies such as federated learning,

blockchain, differential privacy, and Zero Trust Architecture can effectively strengthen data protection while maintaining the advantages of intelligent tourism services. From a managerial perspective, tourism enterprises should establish comprehensive data governance systems, strengthen employee security awareness, improve third-party risk management, and implement continuous cybersecurity monitoring. From a regulatory perspective, organizations should comply with international data protection regulations, including the General Data Protection Regulation (GDPR) and relevant national data protection legislation, to ensure lawful, transparent, and accountable processing of personal information.

The findings of this study have important practical implications for tourism enterprises, government agencies, and technology providers. Tourism organizations should regard data security as a strategic investment rather than merely a compliance requirement. Governments should continue improving digital governance policies and promote international cooperation in cross-border data protection. Meanwhile, technology providers should develop more secure and privacy-preserving digital tourism solutions to support the sustainable development of smart tourism ecosystems.

Nevertheless, this study has several limitations. First, the research mainly adopts a literature review and case analysis approach without conducting empirical investigations using survey data or interviews. Second, some technological applications discussed in this paper are still in the early stages of industrial adoption, and their long-term effectiveness requires further practical validation. In addition, differences in legal frameworks, technological infrastructure, and tourism market characteristics across countries may influence the applicability of the proposed governance strategies.

Future research may focus on empirical studies examining tourists' privacy perceptions and behavioral intentions in digital tourism environments. Researchers may also investigate the effectiveness of emerging privacy-enhancing technologies, including federated learning, differential privacy, blockchain, and artificial intelligence, through real-world tourism applications. Furthermore, comparative studies involving different countries and tourism destinations could provide a deeper understanding of cross-border data governance and international regulatory coordination. As digital tourism continues to evolve, establishing a balance between technological innovation, personalized services, and effective privacy protection will remain one of the most important research priorities for both academia and industry.

In conclusion, digital transformation will continue to reshape the global tourism industry in the coming years. By integrating advanced technologies with robust data governance, effective organizational management, and comprehensive regulatory compliance, tourism enterprises can enhance customer trust, improve cybersecurity resilience, and achieve sustainable digital development. Protecting tourists' personal information should therefore be recognized not only as a legal responsibility but also as a fundamental prerequisite for building a secure, intelligent, and trustworthy digital tourism ecosystem.

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IMPROVING THE MANAGEMENT SYSTEM OF AN EDTECH COMPANY: A MCKINSEY 7S DIAGNOSIS AND AI-DRIVEN RECOMMENDATIONS (EVIDENCE FROM KAZAKHSTAN)

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Abstract. Fast-growing information technology companies routinely outgrow the management systems that once made them successful. This paper examines that transition in a Kazakhstani EdTech firm, Darmen Holding LLP, a software-as-a-service provider serving schools, colleges and regional education authorities under a business-to-government model. Between 2023 and the first half of 2025 the company's gross margin collapsed from 59 % to 41 % while headcount remained unchanged at 46 employees and the product line expanded to five platforms. We diagnose the causes using the McKinsey 7S framework supported by horizontal, vertical and ratio analysis of financial statements. The diagnosis localises the failure in two subsystems - Structure and Systems - and shows that the margin erosion is managerial rather than market-driven: demand from budget-funded customers remained stable throughout. We then propose a programme of measures built around a single principle: scaling through technology instead of headcount. The programme combines a shift to a product-matrix structure, artificial-intelligence-assisted coding, review and first-line support, automation of management accounting, and a development fund financed from retained profit. Each measure is screened for applicability against infrastructure risks characteristic of the Kazakhstani IT sector, including internet and power outages. Under the baseline scenario the programme restores gross margin to 52 % and lifts revenue to 1,836 million tenge by 2030, against 1,400 million under the inertial scenario. The contribution of the paper is threefold: the 7S model is adapted to a B2G EdTech context; digitalisation measures are tied explicitly to financial constraints; and an infrastructure-risk screen is proposed as a selection criterion for management interventions.

Keywords: management system, McKinsey 7S, EdTech, SaaS, business-to-government, digital transformation, artificial intelligence, organisational structure, infrastructure risk, Kazakhstan.

1. Introduction

The digital transformation of education in Kazakhstan has created a domestic market for educational technology that grows on the back of state policy rather than consumer fashion. Schools and colleges are moving record-keeping, learning management and quality monitoring onto digital platforms, and the budget line funding this transition is protected. For a software vendor, this is an unusually comfortable position: demand is stable, weakly correlated with the business cycle, and underwritten by the state.

Comfort, however, is not the same as safety. A company that grows quickly inside such a market eventually meets a constraint that has nothing to do with demand. Its organisational structure, its processes and its way of managing people were designed for a small team; the business they now have is no longer small. The symptoms are familiar to anyone who has watched a technology firm cross this threshold - costs outrun revenue, profitability slides, and the whole enterprise becomes uncomfortably dependent on a handful of key engineers.

This paper studies precisely that transition. The object of the study is the management system of Darmen Holding LLP (Astana, Kazakhstan), a developer of educational software whose product portfolio comprises five SaaS platforms sold to schools, colleges and regional education departments. The firm is a useful case for three reasons. First, its financial trajectory shows a sharp and recent inflection: gross margin fell from 59 % in 2024 to 41 % in the first half of 2025. Second, the inflection cannot be explained by the market, since demand from budget-funded customers did not deteriorate. Third, the firm operates under a business-to-government model in a country where infrastructure reliability - internet connectivity and power supply - is a genuine operational variable rather than an abstraction.

The purpose of the study is to develop an evidence-based programme of measures for improving the company's management system, grounded in a diagnosis of the existing system and screened for applicability against sectoral and infrastructure risks. The hypothesis is that digitalising management processes and embedding artificial intelligence allows the firm to scale without proportional growth in headcount, halt the decline in profitability and sustain development - provided that the proposed solutions withstand infrastructure disruption.

2. Theoretical framework and choice of diagnostic model

The management system of an organisation is conventionally understood as the unity of a managing subsystem and a managed one, connected by control action and feedback [1; 2]. Its constituent elements - goals and strategy, organisational structure, processes and regulations, management methods, personnel and competencies, culture and values - are interdependent, and it is this interdependence that makes piecemeal improvement so often futile [3].

Several frameworks compete for the role of diagnostic instrument. The Balanced Scorecard translates strategy into measurable indicators across four perspectives but presupposes that the strategy itself is sound [4]. The EFQM model offers a deep maturity self-assessment, yet its nine criteria and assessor-based procedure assume an organisational scale that a 46-person firm does not possess. The process approach embedded in ISO 9001 is effective at locating waste inside business processes but is largely silent on culture and leadership style [5].

We adopt the McKinsey 7S framework as the diagnostic lens [6; 7]. The choice is deliberate. The model treats no element as primary: strategy, structure and systems - the so-called hard elements - carry no more weight than staff, skills, style and shared values. For a company whose principal asset is people and whose principal problem is suspected to lie in the interaction between structure and process, this symmetry is exactly what is required. The framework also has the practical virtue of not demanding a large assessment apparatus.

Two further strands of literature inform the recommendations. The first concerns organisational design. Daft's contingency logic holds that no single correct structure exists: it must correspond to strategy, size, technology and environment [8]. Galbraith adds an observation that matters greatly for what follows - matrix structures do not fail on their own; the management of their implementation fails [9]. The second strand concerns artificial intelligence in management. Raisch and Krakowski frame the question as an automation-augmentation paradox: the greatest return comes not from removing the manager from the decision loop but from a hybrid arrangement in which machine intelligence strengthens human judgement [10]. Duan and co-authors approach the same point from the data side, showing that AI shifts decisions from intuitive to evidence-based, but that the shift depends critically on data quality and organisational

readiness [11]. Hanelt and colleagues add the necessary caution: technology adoption alone produces no effect unless business model, structure and management processes change with it [12].

Finally, the subscription business model imposes its own managerial logic, and it is worth stating explicitly because it shapes what "efficiency" means for such a firm. Revenue is determined not by the act of sale but by customer retention, so churn and lifetime value function as everyday management instruments rather than as lines in a financial report. Lindström and co-authors show that a technology firm's transition to a subscription contour forces a revision of the value proposition and the construction of an operating system capable of continuously collecting data and containing churn [13]. The business-to-government segment adds a further twist: conventional lifetime-value formulas, built on average cheque and churn rate, systematically understate the contribution of large institutional buyers - and schools, colleges and education departments are precisely such buyers [14]. Customers are few, but each weighs disproportionately much.

3. Data and methods

The empirical base comprises the company's financial statements for 2023–2024 and the first half of 2025, internal planning documents, and the regulatory framework of the Republic of Kazakhstan. Financial performance is examined by the standard triad of horizontal analysis (dynamics over time), vertical analysis (structure of the profit and loss account) and ratio analysis [15; 16]. Diagnostic scoring of the seven elements of the 7S model uses a three-point scale, where 1 denotes a weak state, 2 an average one and 3 a strong one. Forecasting combines trend extrapolation with scenario construction, distinguishing inertial, baseline and target trajectories [17]. Economic effect is assessed through payback period and net present value [18]. Calculations were performed in MS Excel.

Two limitations should be stated plainly. The diagnostic scores are expert judgements rather than measurements, and the study covers a single firm, which restricts statistical generalisation. What the case can offer is analytical generalisation - a mechanism that other firms in comparable circumstances may recognise.

4. Results

4.1. The financial inflection

Between 2023 and 2024 the company grew in a healthy manner. Revenue rose by 14.9 % (from 768.4 to 882.8 million tenge) while cost of sales grew by only 6.7 %. Revenue outpacing costs by more than a factor of two is what produced the gross margin of 59.4 % recorded in 2024 - an excellent figure for any business and an entirely normal one for mature SaaS.

The first half of 2025 reverses the picture. On revenue of 389.2 million tenge, cost of sales reached 229.9 million. Annualised, revenue barely moves; costs, however, move sharply. The share of cost of sales in revenue jumped by 18.5 percentage points, and net margin fell from 43.5 % to 18.3 %. Table 1 sets out the dynamics.

Table 1. Key financial indicators of Darmen Holding LLP, million tenge

Indicator	2023	2024	H1 2025	2024/2023, %
Revenue	768.4	882.8	389.2	114.9
Cost of sales	335.8	358.4	229.9	106.7
Gross profit	432.6	524.4	159.4	121.2
Administrative expenses	144.9	147.9	82.4	102.1
Net profit	344.0	384.3	71.3	111.7

Note: calculated by the authors from the company's financial statements.

The critical observation is not the fall in profit but its cause. Demand did not weaken; the products did not change; the customer base did not shrink. Costs grew faster than revenue at constant headcount - which means the problem lies inside the organisation of work. When 46 people service an expanding product line across new regions without automation of management processes, the result is overtime, coordination failures and a rising cost of support. The financial statements did not create this problem. They merely recorded it.

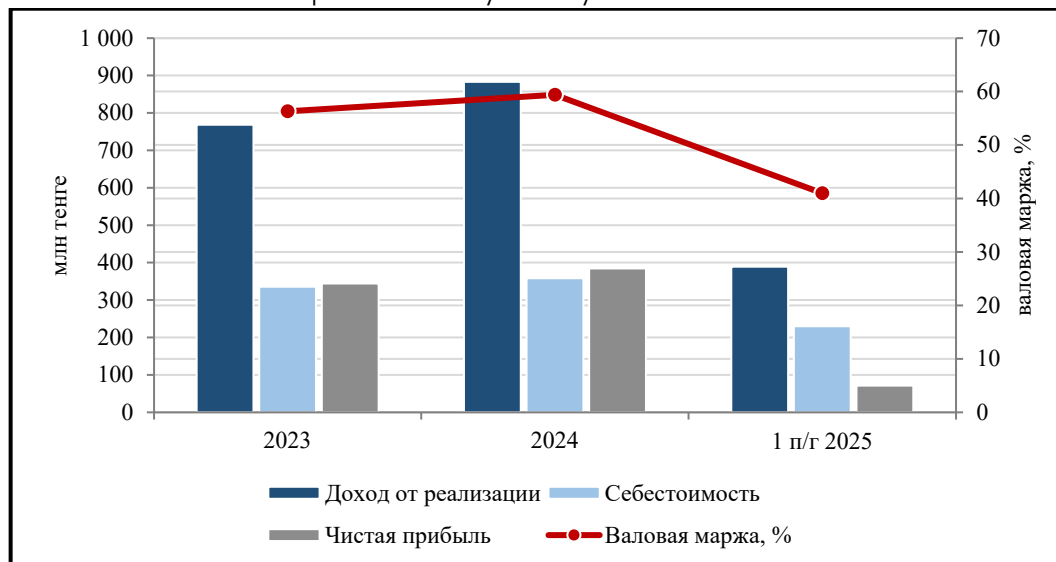


Figure 1. Revenue, cost of sales, net profit and gross margin of Darmen Holding LLP

Note: developed by the authors.

4.2. Diagnosis by the 7S model

The 7S diagnosis converts the financial symptom into a managerial diagnosis. Its results are summarised in Table 2 and visualised in Figure 2.

Table 2. Diagnosis of the management system by the McKinsey 7S model

Element	Current state	Score
Strategy	Regional expansion, revenue growth; reinvestment mechanism absent	Average
Structure	Linear-functional, high centralisation, decisions bottleneck on the owner	Weak
Systems	Manual management, weak automation of accounting and control	Weak
Staff	46 qualified specialists, predominantly developers; no headcount growth	Average
Skills	Strong technological competencies; managerial competencies lag	Average
Style	Direct control by the owner; limited delegation	Average
Shared Values	Product quality orientation, engineering culture	Strong

Note: compiled by the authors.

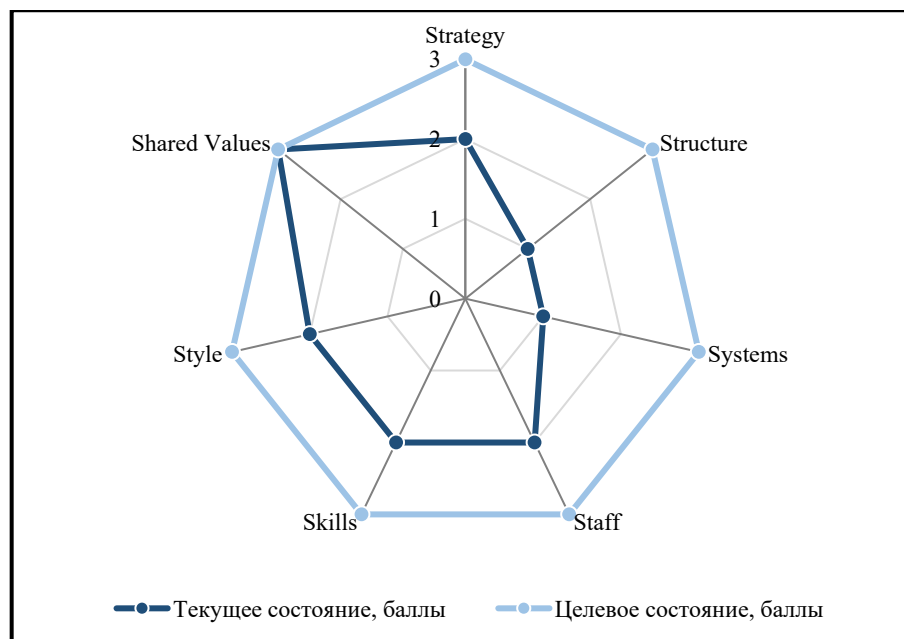


Figure 2. Management system profile of Darmen Holding LLP, 7S model, points

Note: developed by the authors (1 – weak, 2 – average, 3 – strong).

The profile is unambiguous. Two elements collapse: Structure and Systems. The remaining five hold at average or strong levels, with shared values the firm's clear asset - the engineering culture is intact and the orientation towards product quality is genuine. In other words, the company is not failing. One specific joint of its management system is.

Structure fails because a linear-functional design routes every decision through one person. This works at small scale and becomes a bottleneck as the product line and geography expand: the speed of decision-making begins to cap the speed of the business. Systems fail because management remains manual. Neither failure is exotic; both are the standard pathology of a firm that has grown faster than its administrative machinery.

5. Recommendations and risk screening

The programme of measures follows directly from the diagnosis and is organised around one principle - scaling through technology rather than through headcount. Four directions are proposed.

Organisational structure. Transition from a flat functional design to a product-matrix structure: five product directions, each with an owner carrying profit-and-loss responsibility, drawing resources from functional centres of competence. The owner of the business exits the flow of operational decisions. Galbraith's warning applies here - the design is not the difficult part; the implementation is [9].

Business process reengineering. Three processes are addressed first. Development: AI assistants for coding and code review, which generate boilerplate, propose tests and catch routine errors before human review. Support: an AI chatbot handling first-line queries from schools and colleges, freeing engineers from routine tickets. Management accounting: automation and BI dashboards, plus AI-based forecasting of revenue and costs. The rationale for choosing AI over hiring is specific to this firm - the engineers who build educational software can embed AI tools into their own workflow with little external expertise.

Human resources. Digital competency profiles, transparent grades and KPI-linked motivation, internal mentoring so that critical knowledge does not reside in a single head, and HR analytics monitoring workload and burnout risk. The expected return is not speculative: engagement is empirically linked to retention, and in a 46-person firm where one departure affects several products, retention is a strategic variable [19].

Strategic reinvestment. A development fund financed by a fixed share of net profit - approximately 30–35 % - directed into digitalization and AI infrastructure rather than distributed to the owner. This is a management decision rather than an investment: no external financing is required.

Applicability screening deserves separate comment, because it is where a Kazakhstani case departs from a textbook one. Every proposed measure was assessed against infrastructure risks following the logic of ISO 31000 - context, identification, analysis, evaluation, treatment, monitoring [20] - and prioritized by probability and impact in the manner of COSO ERM [21]. Two risks dominate.

The first is an infrastructure blackout: loss of internet connectivity or power. The more a company automates, the more it stakes on network stability. Mitigation is therefore built into the architecture of the solutions rather than bolted on afterwards - a hybrid contour with local caching, so that a support chatbot degrades gracefully instead of failing outright.

The second is concentration on a single solvent customer. The firm's five products create product diversification but not customer diversification: all of them are sold into the state education system, and a cut to the education budget would depress all five simultaneously. This is not merely a budgeting concern. Empirical research on firm resilience shows that customer concentration reduces a company's ability to absorb external shocks, through resource dependence and a shift of bargaining power towards the buyer [22]. Diversifying customers raises resilience more than diversifying products does.

The outcome of the screening is summarised in Table 3. Measures that continue to function during connectivity loss are rated as highly applicable and scheduled first; those that depend on an uninterrupted channel are not rejected, but their architecture is amended before implementation.

Table 3. Applicability of the proposed measures against infrastructure risks

Measure	Technological risk	Blackout risk	Personnel risk	Applicability
AI forecasting of revenue and costs	Low	Low	Low	High
Automation of management accounting, BI	Low	Medium	Low	High
CRM with AI sales analytics	Medium	Medium	Low	High
AI chatbot for first-line support	Medium	High	Low	Medium
Decentralisation, product owners, BI panels	Low	Low	Medium	High
Development fund (reinvestment of profit)	Low	Low	Low	High

Note: compiled by the authors.

The single measure carrying a high blackout risk - the support chatbot - is also the one whose value is greatest during peak load, when schools begin an academic year simultaneously. It is therefore retained, but with a mandatory reserve contour: a local knowledge base and a fallback to human operators. This is what an infrastructure-risk screen actually does in practice. It does not veto measures. It changes how they are built.

6. Economic effect and forecast

Three scenarios were constructed to 2030. The inertial scenario answers the question of what happens if nothing is done: revenue drifts to 1,400 million tenge by 2030 with margin stagnating near current levels. The baseline scenario assumes the programme is implemented as

designed, and the target scenario assumes it is implemented together with entry into new customer segments.

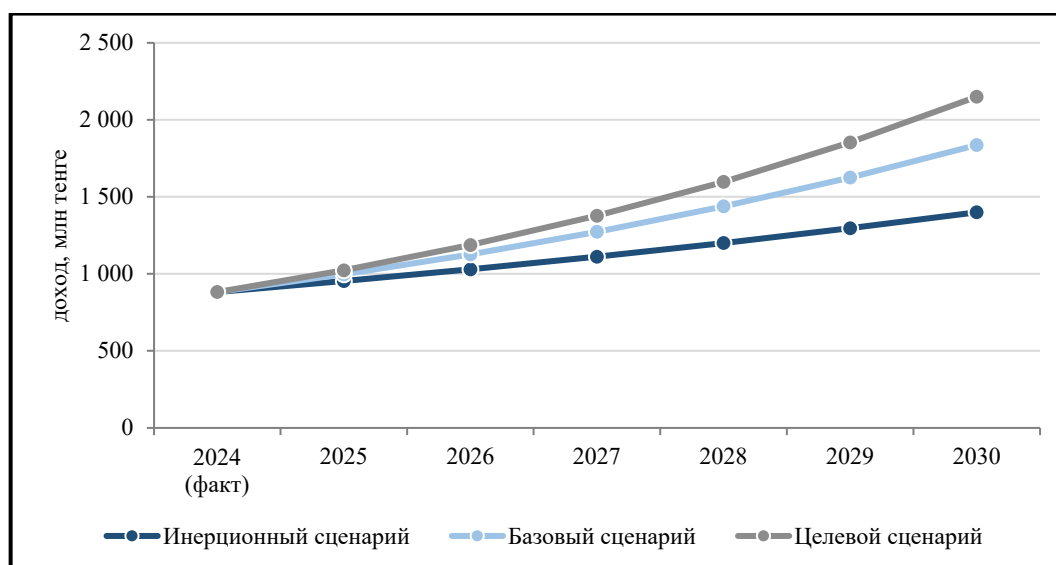


Figure 3. Revenue forecast for Darmen Holding LLP to 2030 under three scenarios, million tenge.

Note: calculated by the authors.

Under the baseline scenario revenue reaches 1,836 million tenge by 2030 and gross margin recovers to 52 %; under the target scenario, 2,150 million and 57 % respectively. The gap between the inertial and target trajectories by 2030 amounts to 750 million tenge - this is the price of inaction, expressed in the only currency management understands. Cumulative effect over 2026–2030 is estimated at 1,459 million tenge against total investment of 270 million, with payback achieved within the first year of implementation. The investment is comparable to two months of the company's current net profit and is fully covered by the development fund without recourse to external borrowing.

7. Conclusion

The case of Darmen Holding illustrates a mechanism rather than an anomaly. A firm succeeds, grows, adds products and regions - and its management system, unchanged, quietly becomes the binding constraint. The margin collapse from 59 % to 41 % looks like a financial event; the 7S diagnosis shows it to be a managerial one, localised in Structure and Systems.

Three contributions follow. First, the McKinsey 7S framework is adapted to the specific context of an EdTech company operating under a business-to-government model in Kazakhstan, where the customer is the state and the infrastructure is not guaranteed. Second, the programme of measures ties digitalisation and artificial intelligence explicitly to the firm's financial constraints and growth strategy, rather than treating technology adoption as a good in itself. Third, an infrastructure-risk screen is proposed as a selection criterion for management interventions - a criterion largely absent from the mainstream literature, which implicitly assumes that electricity and connectivity are free goods.

The practical implication for comparable firms is uncomfortable but simple. The resource for restoring profitability in a technology company that has outgrown its management system does not lie in hiring. It lies in rebuilding the processes through which the existing people work - and in accepting that structure, systems and culture must move together, or they will not move at all.

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Pedagogical Sciences

FEATURES OF THE DEVELOPMENT OF STEM EDUCATION

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At the present stage, the world has entered the era of the Fourth Industrial Revolution. The rapid development of information technologies, digital innovations and scientific achievements are making significant changes in all spheres of society's life. As a result of such changes, the requirements of the labor market, the needs of society and the needs of the individual also take on a new character. Therefore, the education system is faced with the task not only to provide students with theoretical knowledge, but also to form competencies that can adapt them to modern requirements.

In this sense, the STEM educational direction is of particular importance. The concept of STEM refers to the comprehensive study of Science, Technology, Engineering and mathematics. This approach allows you to combine the knowledge gained by students in various disciplines and effectively apply them in life situations. At the same time, the STEM education system is aimed at the formation of creative thinking, logical reasoning, problem-solving skills and a culture of research. The main feature of STEM learning is not to consider subjects separately from each other, but to show their relationship through real experiences. Such an integrative approach creates conditions for students to learn scientific concepts in connection with everyday life. According to the definition of Tsupros (2009), STEM is an educational model that combines academic scientific and technical knowledge with real – life conditions. Its main goal is to strengthen the relationship between school, society and industry, improve students' STEM literacy and strengthen their competitiveness in the global labor market.

Currently, STEM education has become one of the priorities at the international level. In connection with the rapid development of scientific and technological progress, new professions are emerging, and the demand for engineers, programmers, researchers and specialists in the field of high technology is growing every year. In this regard, many states are considering STEM education as the main direction of national educational policy. In particular, the states of Australia, USA, Great Britain, Singapore, Israel, China and Korea are successfully implementing state programs for the development of STEM education.

In Kazakhstan, in recent years, special attention has been paid to improving STEM education. As part of the modernization of the education system, STEM elements are gradually being introduced into curricula, which include scientific research, engineering design, mathematical modeling and modern digital technologies. The main goal of such changes is to train specialists who meet international requirements, think creatively and are able to implement innovative ideas.

Today, the STEM direction is not limited only to technical disciplines. In recent years, the STEAM concept has been widely developed, which combines such creative directions as art, design, architecture and industrial aesthetics into it. This direction strengthens the relationship between science and art and allows you to reveal the creative potential of students to the maximum. Because in modern society, scientific knowledge alone is not enough, the ability to combine it with creative thinking and aesthetic taste is becoming increasingly important.

STEM educational programs occupy an important place in the formation of a culture of scientific thinking and improving technological competencies of students. The educational process in this direction allows not only to deepen students' knowledge of Natural Sciences and modern technologies, but also to develop the ability to conduct research work. In the course of the study, students learn to comprehensively analyze the problem, draw reasoned conclusions, form logical thinking and critical attitude. Such skills are considered the main component of scientific activity.

One of the main features of the STEM methodology is the effective use of modern technologies in the course of training. Through the use of various digital tools and Engineering Devices, students perform experimental work, looking for solutions to the problems they face in real life. Such practical activities allow them to combine the acquired theoretical knowledge with practice and increase their interest in the subject.

In addition, STEM education also contributes to the formation of communicative and social skills of students. In the process of working on different projects, they practice joint action within the team, correctly sharing tasks, proving their opinion and making a common decision. The project-based learning approach increases students' responsibility and develops the ability to effectively plan and manage time. As a result, students acquire not only theoretical knowledge, but also professional skills that are in demand in the field of modern production and technology.

The interconnection of Science and technology provides a great opportunity to develop the intellectual potential of students. Such an educational system improves their creative abilities, stimulates them to come up with innovative ideas and implement them. Therefore, STEM education is considered an effective means of training competitive and highly qualified specialists who can meet the requirements of modern society.

In the coming years, the demand for specialists in the fields of information technology, programming, engineering, artificial intelligence and high-tech production in the labor market will increase more than ever. As a result of the widespread spread of digitalization, the content of many traditional professions changes and new professions appear. Therefore, the preparation of modern students for the future labor market is one of the most important tasks of the education system.

In the future, the rapid development of such areas as biotechnology, nanotechnology, robotics, artificial intelligence, data analysis and digital engineering will form the basis for the formation of new professions. At the moment, some of such professions are just developing, but in the future their role in society will significantly increase. In this regard, starting from the walls of the school, the formation of students' knowledge and practical skills in the scientific and technical direction becomes a particularly urgent problem.

STEM education develops students' logical thinking, ability to analyze, and skills to effectively solve complex problems. These competencies play an important role not only in the course of professional activity, but also in everyday life. At the same time, students learn new technologies and adapt to their effective use. Such training will allow them to quickly adapt to the changing labor market and become more successful from a professional point of view.

STEM education is also important for society. The economy of states with high scientific and technical potential is steadily developing, and the number of innovative projects increases. Trained specialists in the field of STEM contribute to the modernization of production, the introduction of new technologies and improving efficiency in various sectors of the economy. At the same time, the development of scientific research is the basis for the opening of new industries, improving the quality of products and strengthening the competitiveness of the national economy. Thus, STEM education is one of the most important factors that directly affect the socio-economic development of the country.

Further improvement of STEM education in Kazakhstan is one of the most important areas of bringing the education system in line with international requirements. To increase the scientific

and technical potential of the country and develop an innovative economy, it is necessary to systematically update the content and methodology of STEM training. Work in this direction forms the scientific worldview of students, allows them to master modern technologies and be ready for future professions.

First of all, the modernization of teaching methods used in the educational process is of particular importance. Along with traditional teaching approaches, it is necessary to widely introduce research-based, project-based and experiential learning technologies. Such methods increase students' interest in the subject and create conditions for them to learn knowledge through practice. Interactive tasks, practical laboratories, engineering projects and the use of digital tools during classes are one of the most effective ways to improve the quality of Education.

The quality of STEM education largely depends on the professional training of teachers. Therefore, one of the most important tasks is the continuous improvement of teachers' qualifications, familiarization with new technologies, innovative teaching methods and international experience. Special courses, seminars, experience exchange programs and professional development projects allow you to form modern competencies of teachers. At the same time, the alignment of curricula with world educational standards will contribute to improving the quality of education of Kazakhstani students at the international level.

Special attention also needs to be paid to improving the material and technical base of schools for the effective organization of STEM education. Providing educational institutions with new generation laboratories, robotics classrooms, programming classrooms and digital devices will allow students to apply the knowledge gained in practice. Such an educational environment develops their creative abilities and forms a culture of engineering thinking.

The role of partnership between the state and the private sector in the development of the STEM direction is also special. Production facilities, universities, research centers and technology companies need to implement joint projects with educational organizations. As part of such cooperation, students have the opportunity to undergo industrial practice, participate in various research projects and solve specific production tasks. At the same time, support for innovative initiatives, startups and scientific research at the state level contributes to the sustainable development of the STEM ecosystem.

Currently, the development of the world economy directly depends on the achievements of Science and technology. In this regard, STEM education is considered as a modern educational model aimed at the integrated development of research culture, engineering thinking, digital literacy and creative abilities of students. This approach allows students not only to qualitatively master the school curriculum, but also to adapt to the requirements of the changing labor market.

In conclusion, STEM education is one of the priorities of the modern education system. Its main goal is the development of functional literacy, research ability and innovative thinking of students, interconnecting science, technology, engineering and mathematics. Through the systematic development of STEM education in Kazakhstan, it is possible to train young specialists with high scientific potential, creative and competitive at the international level.

Therefore, updating the content of training, increasing the professional competence of teachers, the formation of modern infrastructure and strengthening partnerships between the state and business are the main prerequisites for improving the effectiveness of STEM education.

Technical Sciences

Data-Driven Picking Route Optimization in Smart Warehousing: Evidence from a Public WMS Dataset

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Abstract.

This study investigates wave-level picking route distance in a real footwear-manufacturing warehouse using a public Warehouse Management System (WMS) dataset. Because reliable picking start and completion timestamps are unavailable, the analysis focuses on horizontal travel distance reconstructed from storage-location coordinates. After matching picking records with valid coordinates, the final routable sample contains 7,323 picking waves and 161,347 picking records. Manhattan distance is used to represent aisle-constrained movement. The empirical design combines regression analysis with route simulation. Three regression models evaluate whether order complexity and spatial structure explain baseline route distance, while the simulation compares the recorded baseline sequence, S-shape routing, and a Nearest Neighbor route improved by 2-opt. Adding location dispersion, aisle span, and average depot distance increases model R-squared from 0.715 to 0.843; operator and month fixed effects raise it only slightly to 0.848. In the simulation, S-shape routing produces an average wave-level increase of 4.26%, whereas NN + 2-opt achieves an average wave-level reduction of 16.28% and outperforms the baseline in 80.66% of routable waves. The results show that spatial structure is essential for explaining picking travel and that familiar rule-based policies should be tested against actual layouts before implementation. A simple, transparent heuristic can provide substantial route savings without requiring exact optimization or major automation investment.

Keywords: smart warehousing; order picking; route distance; WMS; S-shape routing; nearest neighbor; 2-opt; warehouse optimization

1. Introduction

Smart warehouses must process increasingly fragmented orders without giving up speed or accuracy. This is a routine challenge in manufacturing, e-commerce, and supply-chain operations, where fulfillment windows are short and demand is uneven. In picker-to-parts systems, a worker or device leaves the depot, visits the required storage locations, collects items, and returns to a consolidation point. Travel therefore consumes a substantial share of picking effort; even modest reductions can free capacity and reduce avoidable movement.

Order-picking performance reflects a combination of layout, storage assignment, batching, zoning, and routing decisions. Routing is especially practical because it can often be adjusted without changing the physical warehouse. Even so, many facilities rely on fixed traversal rules, historical sequences, or rules of thumb. Whether such a rule works depends on depot location, aisle geometry, pick density, and the way each wave is distributed across the warehouse. A policy that works well in one setting may add travel in another.

Much of the routing literature is built on simulated instances or simplified layouts. That work is essential for algorithm development, but operational WMS records bring complications that simulations may not capture. Public datasets from real warehouses are still uncommon. This study therefore uses a public order-picking dataset from a footwear manufacturing warehouse to reconstruct wave-level routes from recorded picks and storage coordinates.

The analysis asks three linked questions: whether order-complexity measures explain baseline route distance; whether spatial indicators add explanatory power; and whether familiar routing strategies improve on the recorded sequence. To address the final question, the study compares the baseline route with S-shape routing and a Nearest Neighbor route refined through 2-opt local search.

The study makes a practical rather than algorithmic contribution. It shows how public WMS data can support a reproducible route-distance experiment, separates workload from spatial difficulty in the regression analysis, and tests familiar routing rules against observed waves. In the studied layout, S-shape routing raises average distance, whereas NN + 2-opt delivers substantial savings across a wide share of waves. Figure 1 summarizes the research framework.

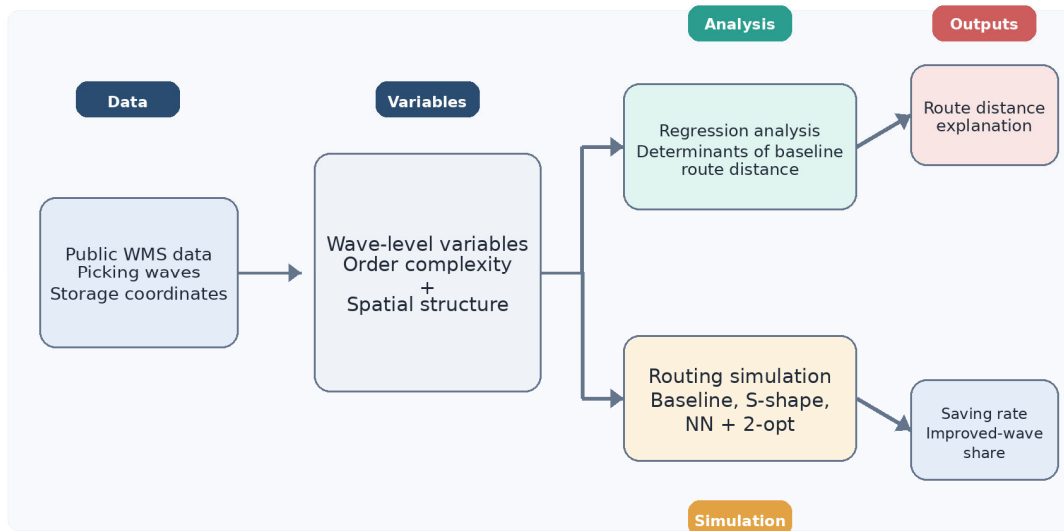


Figure 1. Research framework for wave-level route-distance analysis.

2. Related Work

Order picking is widely regarded as one of the most labor-intensive and cost-sensitive warehouse activities. Because travel constitutes a substantial share of manual picking effort, route distance is a central performance measure in warehouse operations research (Gu et al., 2007; de Koster et al., 2007; Grosse et al., 2015). Recent work continues to examine travel reduction under e-commerce, manufacturing-logistics, and smart-warehouse conditions (Boysen et al., 2019; Ali and Phan, 2022). Recent research has also extended picker-routing analysis to mixed-shelves e-commerce warehouses (Weidinger et al., 2019). Reviews show that picker routing has been studied using exact methods, classical heuristics, metaheuristics, and integrated decision models, while repeatedly emphasizing that performance depends on layout, depot position, aisle structure, and pick-location distribution (Masae et al., 2020).

Picking distance is shaped by both order complexity and spatial structure. A wave with more locations or SKUs usually requires more travel, but waves with the same location count can have very different distances if one set of locations is clustered and another is spread across several aisles. Storage and routing decisions therefore interact, and workload measures alone cannot represent the physical difficulty of a wave (Petersen and Aase, 2004; van Gils et al., 2018).

Location dispersion, aisle span, and depot distance are useful spatial descriptors because they capture how far apart required positions are and how far the picker must move from the route origin.

Classical routing rules include S-shape, Return, Midpoint, Largest Gap, Combined, and optimal routing methods (Petersen, 1997; de Koster and van der Poort, 1998; Roodbergen and de Koster, 2001). S-shape is easy to understand and implement, but its performance is context dependent. It can be effective when required positions are distributed throughout traversed aisles; it can also create unnecessary movement when picks are sparse, clustered near aisle entrances, or unevenly distributed. This makes it an appropriate benchmark rather than an assumed best policy.

Route construction can also be treated as a traveling-salesman-type problem (Ratliff and Rosenthal, 1983). Nearest Neighbor provides a transparent starting solution by repeatedly selecting the closest unvisited location, while 2-opt improves a route through local segment exchanges. These heuristics are computationally light, interpretable, and compatible with practical WMS decision support (Theys et al., 2010; Scholz et al., 2016). Rather than proposing a new algorithm, this study tests how such familiar rules perform when applied to public operational WMS records and an observed warehouse layout.

3. Data and Methods

3.1 Data source and sample construction

The analysis uses the Order Picking Dataset from a Warehouse of a Footwear Manufacturing Company, released through Mendeley Data and documented by de Assis et al. (2024, 2025). The dataset was extracted from the company WMS and includes picking-wave records, customer orders, products, storage-location coordinates, warehouse-layout files, and supporting scripts. Four CSV files are used directly: `Picking_Wave.csv`, `Storage_Location.csv`, `Customer_Order.csv`, and `Product.csv`.

`waveNumber` identifies an operational picking task and is therefore used as the unit of analysis. The original picking table contains 215,192 records across 9,707 waves, while `Storage_Location.csv` provides 2,292 locations with complete x-, y-, and z-coordinates. A small number of location codes cannot be matched to valid coordinates: 23,609 records involve 22 unmatched codes, and RC-01 alone accounts for 22,979 of them. Because a route cannot be reconstructed without coordinates, waves containing an unmatched position are excluded. This leaves 7,323 complete waves and 161,347 picking records.

When the same location appears more than once within a wave, it is treated as additional workload rather than another route stop. Route reconstruction visits each unique storage location once, while repeated lines and quantities are retained for Pick-Line Count and Total Quantity. The final sample averages 11.19 unique locations per wave, with a maximum of 25. Figure 2 shows the sample construction and filtering process, and Table 1 summarizes the data sources and variables.

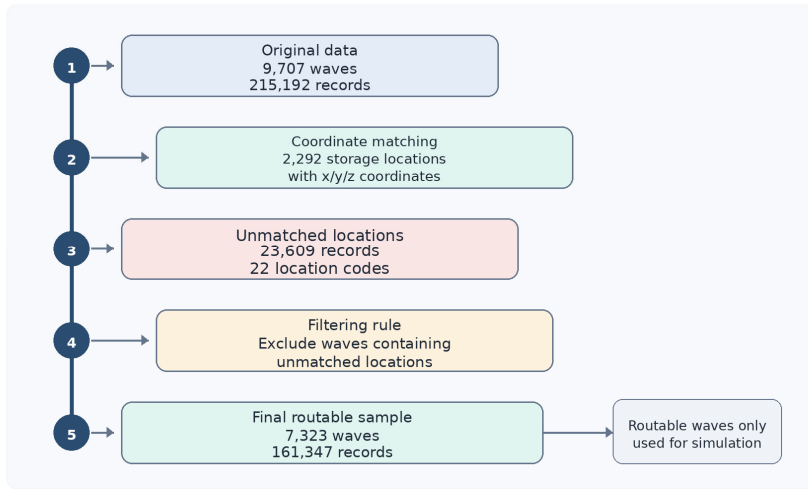


Figure 2. Sample construction and routable-wave filtering process.

Table 1. Data sources and principal variables

Data/variable	Definition or content	Role
Picking_Wave.csv	Wave number, storage location, operator, quantity	Core wave and workload records
Storage_Location.csv	Storage identifiers and x/y/z coordinates	Route distance and spatial measures
Customer_Order.csv	Order date, wave number, operator	Month controls and linkage
Product.csv	Product identifiers, ABC class, sector	SKU identification
Baseline Distance	Distance under recorded location sequence	Regression dependent variable and benchmark
Location Count / SKU Count	Unique locations / unique products in a wave	Order complexity
Pick-Line Count / Total Quantity	Picking records / total picked quantity	Workload intensity
Location Dispersion	Average pairwise Manhattan distance	Spatial spread
Aisle Span	Difference between maximum and minimum aisle positions	Spatial coverage
Average Depot Distance	Mean distance from depot to required locations	Access difficulty

3.2 Route reconstruction and distance measures

Each route starts at the depot, visits all required unique storage locations, and returns to the depot. The z-coordinate is excluded because the analysis focuses on horizontal warehouse movement. Since travel is constrained by aisles and orthogonal paths, Manhattan distance is used between locations i and j :

$$d_{i,j} = |x_i - x_j| + |y_i - y_j| \quad (1)$$

For a route containing n visited positions, total route distance is calculated as the sum of the depot-to-first-location distance, distances between consecutive positions, and the final return to the depot:

$$D = d_{0,1} + \sum_{k=1}^{n-1} d_{k,k+1} + d_{n,0} \quad (2)$$

The baseline route follows the original WMS record or location sequence within each wave after duplicate positions are removed. Route Saving Rate is calculated for each wave and then averaged across waves:

$$\text{SavingRate}_w = \frac{D_{\text{baseline},w} - D_{\text{method},w}}{D_{\text{baseline},w}} \times 100\% \quad (3)$$

The CSV files do not contain reliable picking start time, completion time, or task duration. Customer-order creationDate is therefore used only for month controls, and the paper makes no claims about observed labor time or productivity.

3.3 Regression models

Baseline route distance is estimated with three ordinary least squares specifications. Model 1 includes Location Count (L), SKU Count (S), Pick-Line Count (P), and Total Quantity (Q). Model 2 adds Location Dispersion (G), Aisle Span (A), and Average Depot Distance (C), while Model 3 adds operator and month fixed effects. Robust standard errors are reported throughout.

$$D_w = \beta_0 + \beta_1 L_w + \beta_2 S_w + \beta_3 P_w + \beta_4 Q_w + \varepsilon_w \quad (4)$$

$$D_w = \beta_0 + \beta_1 L_w + \beta_2 S_w + \beta_3 P_w + \beta_4 Q_w + \beta_5 G_w + \beta_6 A_w + \beta_7 C_w + \varepsilon_w \quad (5)$$

$$D_w = \beta_0 + \sum_{j=1}^7 \beta_j X_{jw} + \lambda_o + \tau_m + \varepsilon_w \quad (6)$$

3.4 Routing strategies

Three routing strategies are compared. The baseline preserves the recorded reference sequence. S-shape sorts locations by aisle and alternates direction across successive aisles to approximate a serpentine traversal. It serves as a familiar benchmark that is easy to explain and operate.

NN + 2-opt is the primary heuristic. Starting from the depot, Nearest Neighbor selects the closest unvisited location under Manhattan distance until all required positions have been visited. The 2-opt stage then examines pairs of route segments and reverses a segment whenever the exchange shortens the route. The process stops when no further improvement is available. Its transparency and modest computational requirements make it suitable for a WMS recommendation module.

4. Results

4.1 Descriptive evidence

The retained waves contain substantial variation in workload and spatial structure. Mean baseline distance is 4,606.56 coordinate units, with a standard deviation of 1,317.70. Average Location Count is 11.19, average SKU Count is 6.54, and average Pick-Line Count is 12.36. Mean Location Dispersion is 352.70, while Average Depot Distance is 1,292.11. This variation supports wave-level modelling rather than treating all picking tasks as operationally equivalent. Table 2 reports the descriptive statistics for the retained wave-level sample.

Table 2. Descriptive statistics of wave-level variables

Variable	Mean	Std. dev.	Min	Median	Max
Location Count	11.19	6.29	1.00	12.00	25.00
SKU Count	6.54	4.17	1.00	6.00	21.00
Pick-Line Count	12.36	7.18	1.00	13.00	30.00
Total Quantity	23.28	6.84	1.00	24.00	192.00
Location Dispersion	352.70	157.31	0.00	391.58	1,184.00
Aisle Span	15.21	7.11	0.00	18.00	23.00
Average Depot Distance	1,292.11	179.24	621.00	1,276.75	2,037.00
Baseline Distance	4,606.56	1,317.70	1,242.00	4,670.00	9,034.00

4.2 Determinants of baseline distance

In Model 1, Location Count and SKU Count are both positively and significantly associated with baseline distance. Pick-Line Count becomes negative once unique locations and SKUs are held constant. This does not imply that more pick lines shorten a route; rather, additional lines may reflect repeated or denser work at locations already on the route instead of wider travel. Total Quantity is not statistically significant.

Model 2 provides the clearest improvement in explanatory power: R-squared rises from 0.715 to 0.843, a gain of 0.128. Location Dispersion, Aisle Span, and Average Depot Distance are all positive and highly significant. Route distance therefore reflects more than workload; the physical spread and accessibility of required locations are central.

Adding operator and month fixed effects in Model 3 increases R-squared only slightly, from 0.843 to 0.848. These controls account for some additional variation, but they do not change the central result: observed baseline travel is driven mainly by order complexity and spatial structure. Table 3 reports the full estimates, and Figure 3 shows how explanatory power changes across the models.

Table 3. Regression results for baseline route distance

Variable	Model 1	Model 2	Model 3
Location Count	129.300*** (4.052)	106.815*** (3.089)	103.729*** (3.155)
SKU Count	149.099*** (4.060)	107.275*** (3.414)	108.960*** (3.384)
Pick-Line Count	-39.521*** (3.610)	-28.637*** (2.559)	-26.227*** (2.603)
Total Quantity	1.761 (1.136)	0.828 (0.966)	0.555 (0.952)
Location Dispersion	—	1.486*** (0.064)	1.491*** (0.065)
Aisle Span	—	27.453*** (1.693)	27.432*** (1.695)
Average Depot Distance	—	1.871*** (0.030)	1.879*** (0.031)
Operator FE	No	No	Yes
Month FE	No	No	Yes
Observations	7,323	7,323	7,323
R-squared	0.715	0.843	0.848
Adjusted R-squared	0.715	0.843	0.847

Note. Robust standard errors in parentheses. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

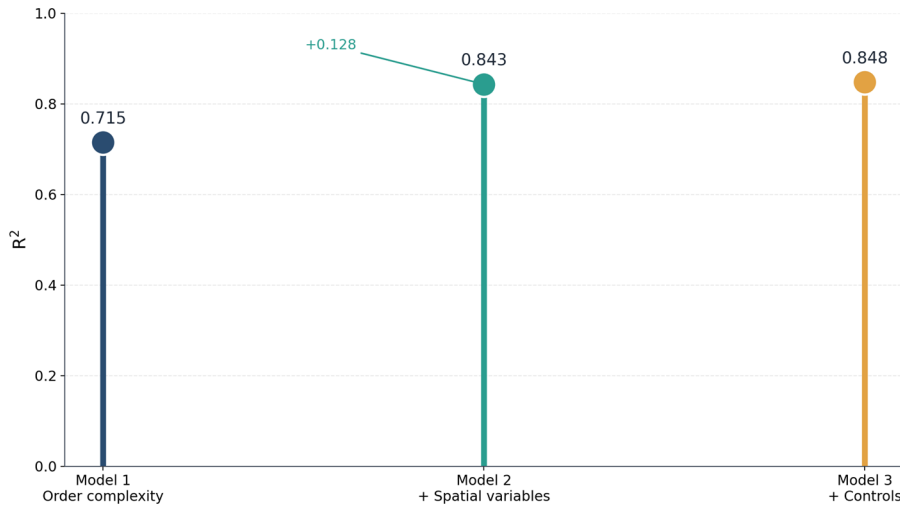


Figure 3. Explanatory power of the regression models.

4.3 Route simulation

The three strategies lead to distinctly different outcomes. Mean baseline distance is 4,606.56, whereas S-shape reaches 4,835.71 and raises average wave-level distance by 4.26%. In this warehouse, a fixed serpentine traversal does not fit the observed distribution of required locations.

NN + 2-opt reduces mean distance to 3,717.89 and achieves an average wave-level saving of 16.28%. It outperforms the baseline in 80.66% of routable waves. The percentage reduction obtained by dividing the two sample means is larger than 16.28%, because the reported indicator first calculates the saving rate for each wave and then averages those rates. The wave-level average is used because the picking wave is the unit of analysis. Table 4 reports the route simulation results, and Figure 4 compares mean route distance across strategies.

Table 4. Route simulation results

Routing strategy	Mean route distance	Mean change	wave-level	Share better than baseline
Baseline	4,606.56	—	—	—
S-shape	4,835.71	+4.26%	Not better	consistently
NN + 2-opt	3,717.89	-16.28%	80.66%	

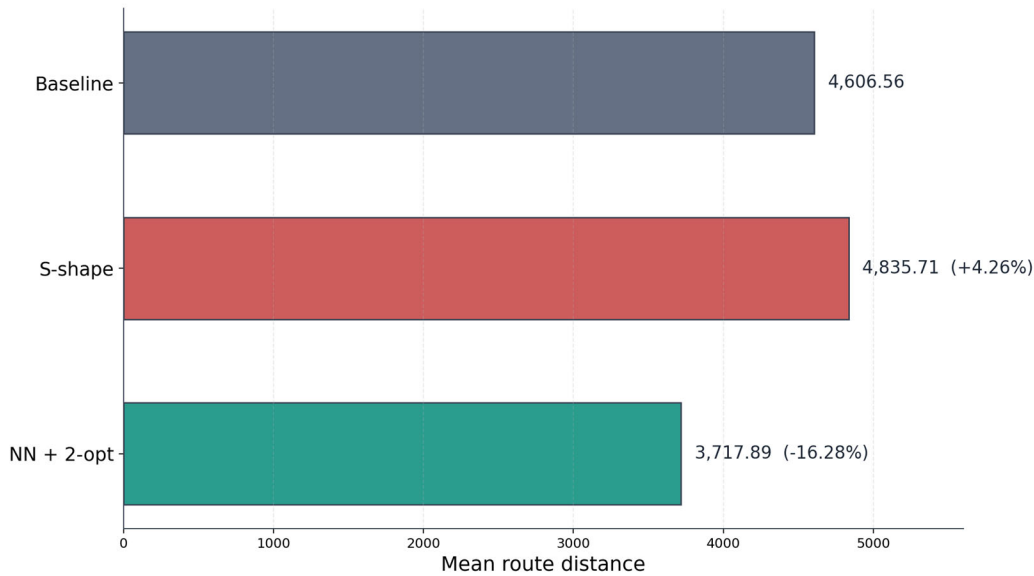


Figure 4. Mean route-distance comparison across routing strategies.

5. Discussion

Taken together, the results show that location count alone is not enough to explain picking travel. Two waves with similar workloads can have different route lengths because their locations differ in dispersion, aisle coverage, and proximity to the depot. This supports the view that storage, layout, and routing should be treated as interacting decisions.

The S-shape result requires careful interpretation. S-shape is a heuristic, not a universal optimum. Its simplicity is operationally attractive, but it can generate unnecessary full-aisle traversal when picks are sparse or concentrated near aisle entrances. The observed 4.26% increase does not imply that S-shape is generally ineffective; it shows that the rule is unsuitable for the particular layout and wave-location patterns analysed here. Warehouse managers should therefore test familiar policies on historical WMS waves before implementation.

NN + 2-opt performs well because it adapts to the locations required in each wave. It does not require an exact optimization model, specialized hardware, or a large automation project. A WMS can generate candidate routes offline, compare them with current sequences, and present a recommended visiting order. More than four-fifths of waves improve, suggesting that the benefit is broadly distributed rather than driven by a few extreme cases.

The analysis also shows why public operational datasets are valuable. Simulations are essential for controlled benchmarking, but real WMS data reveal missing coordinates, repeated locations, non-standard location codes, and irregular wave composition. Documenting how these issues are handled is important for reproducibility and for keeping conclusions proportionate to the data.

Three limitations should be noted. First, the outcome is route distance, not observed picking time, because the CSV files do not contain reliable task start and completion timestamps. Second, waves containing unmatched storage positions are excluded, which improves

measurement consistency but reduces the sample. Third, the analysis does not integrate batching, storage reassignment, zoning, congestion, picker fatigue, or exact optimization. These extensions would require additional data and a broader research design.

6. Conclusion

Using a public WMS dataset from a footwear manufacturing warehouse, the study retained 7,323 routable picking waves and 161,347 records after coordinate matching and filtering. Routes were reconstructed from unique storage locations with Manhattan distance, while repeated records were retained as workload measures rather than additional route visits.

Two findings stand out. Baseline distance is shaped by both order complexity and spatial structure: adding Location Dispersion, Aisle Span, and Average Depot Distance increases R-squared from 0.715 to 0.843, while operator and month controls add little further explanatory power. Routing-policy choice also matters. S-shape increases mean wave-level distance by 4.26%, whereas NN + 2-opt reduces it by 16.28% and improves 80.66% of waves.

For managers, the implication is clear: a routing rule should be tested against the actual layout and historical wave patterns before it is adopted. Where WMS records and storage coordinates are available, a transparent heuristic such as NN + 2-opt offers a low-cost starting point for data-driven route recommendations. Future work can incorporate observed scan times, congestion, batching, storage reassignment, and additional routing methods.

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Machine Learning-Based Demand Forecasting and Inventory Replenishment in Smart Warehousing: A Cost-Sensitivity Analysis Using Public Retail Sales Data

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Abstract.

Demand uncertainty is a practical bottleneck in smart warehousing and retail inventory management. This study examines whether a machine-learning forecast can improve replenishment decisions beyond a simple moving average benchmark. Using the M5 retail sales dataset, the paper compares a 7-day moving average with a Random Forest model and then feeds both forecasts into a reorder point-based inventory simulation. The sample covers the top 100 FOODS SKUs in Walmart store CA_1 during a 28-day out-of-sample test period. Random Forest improves forecast accuracy: WAPE decreases from 39.82% to 35.03%, a relative improvement of 12.05%. Service outcomes also improve: stockout rate falls from 3.04% to 2.43%, and lost sales decrease from 724 to 537 units. The cost result is conditional. Under the baseline cost setting, the Random Forest policy carries more inventory and produces a slightly higher total cost. Sensitivity analysis shows that the model becomes economically attractive when stockout penalties are higher or holding costs are lower. These findings suggest that machine-learning forecasts can support smart warehousing by reducing service risk, but their economic value depends on inventory cost structure.

Keywords: smart warehousing; demand forecasting; inventory replenishment; Random Forest; moving average; stockout risk; M5 Forecasting dataset

1. Introduction

E-commerce, omnichannel retailing, and data-driven logistics have changed what warehouses are expected to do. In addition to storing goods, they now support demand planning, inventory positioning, replenishment, fulfillment, and service reliability. Smart warehousing matters because it connects information, equipment, processes, and decisions in a system that can respond to changing operating conditions.

Demand forecasting and replenishment are central to this system. Underestimating demand can lead to stockouts, lost sales, delayed fulfillment, and weaker service. Overestimating it ties up capital, occupies storage space, and raises holding cost. The practical task is not simply to produce an accurate forecast, but to turn sales history and contextual information into replenishment decisions that balance availability and cost.

Moving averages remain popular because they are transparent, inexpensive, and easy to explain. They work well when recent demand is a reasonable guide to the near future. Retail demand, however, also responds to weekly cycles, price changes, events, holidays, promotions, seasonality, and product-level differences. Machine-learning models can bring these signals together and capture relationships that a simple average is likely to miss.

For managers, accuracy is not the whole story. MAE, RMSE, MAPE, and WAPE are useful for comparing prediction errors, but they do not by themselves show whether a warehouse can

reduce stockouts, lower cost, or improve fill rate. A more accurate model may reduce lost sales while requiring more inventory; a simpler model may save holding cost while increasing service risk. The analysis therefore evaluates forecasts through their downstream inventory outcomes.

The empirical comparison pairs a 7-day moving average with a Random Forest model using public M5 retail sales data. Random Forest can capture nonlinear relationships while remaining easier to implement and explain than many deep-learning alternatives. The analysis focuses on the top 100 FOODS SKUs in Walmart store CA_1 in California over a 28-day out-of-sample period. It links prediction quality with replenishment, service, and cost.

This reflects a familiar replenishment problem. A model may lower statistical error, but managers must still decide whether to order earlier, order more, or accept a higher risk of shortage. Lead time, safety stock, ordering frequency, storage capacity, and the relative cost of holding inventory and losing sales all shape that decision. A forecasting model should therefore be tested within an inventory decision process rather than treated as an isolated prediction exercise.

The study is intentionally designed as a compact applied analysis. Instead of comparing many complex algorithms, it focuses on one transparent benchmark and one practical machine-learning model. This design makes the contribution easier to interpret for small and medium-sized logistics firms that may not have the resources to implement deep learning systems but can use tree-based models with common software tools. The analysis therefore supports both academic discussion and practical decision-making in smart warehousing.

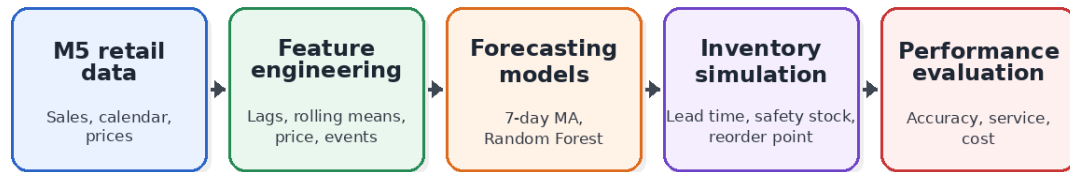


Figure 1. Research framework of demand forecasting-driven inventory replenishment.

2. Literature Review

Smart warehousing research increasingly treats the warehouse as a data-enabled decision system rather than a passive storage facility. Zhen and Li (2022) emphasize information interconnection, automation, process coordination, and sustainability as key dimensions of smart warehousing. These capabilities create operational value only when they improve decisions such as replenishment timing, safety-stock setting, order-up-to levels, and inventory allocation. Classical inventory theory also shows that replenishment depends on expected lead-time demand, demand variability, service targets, holding cost, and shortage cost (Silver et al., 1998).

Retail demand forecasting is difficult because SKU-level sales are heterogeneous, seasonal, intermittent, and affected by prices, events, calendar effects, and store-level behavior. The M5 Forecasting dataset is suitable for this study because it combines daily Walmart unit sales with product hierarchy, store and state identifiers, calendar events, SNAP indicators, and selling prices. Makridakis et al. (2022) describe M5 as a large-scale benchmark involving 42,840 hierarchical unit sales series. The product-store-day structure allows forecasts to be translated into replenishment simulation rather than evaluated only as statistical predictions.

In warehouse operations, these forecasting difficulties have direct operational consequences. Intermittent demand and short-term demand spikes can distort simple averages, especially when products are affected by weekly shopping routines, temporary events, or price changes. A model that ignores such contextual information may systematically underprepare inventory before demand increases or overprepare inventory after a temporary spike has already passed.

The M5 dataset is useful here because it combines target demand series with the contextual variables needed for feature construction. It makes it possible to move from public data to an operational evaluation rather than discussing smart warehousing only in conceptual terms.

Machine-learning methods can combine lagged demand, rolling averages, prices, events, and product information in nonlinear ways. Carbonneau et al. (2008) show their value for noisy supply-chain demand signals, while Fildes et al. (2009) highlight the practical difficulty of supply-chain forecasting. Random Forest averages multiple decision trees, reducing the instability of a single tree while retaining nonlinear effects (Breiman, 2001). It is easier to implement and explain than many deep-learning models, yet it can use richer contextual information than a moving average.

Forecast accuracy and inventory performance do not always move together. Syntetos and Boylan (2006) argue that intermittent-demand methods should be judged by stock-control performance as well as forecast error, and Tadayonrad and Ndiaye (2023) similarly connect forecasting evaluation with inventory reliability and seasonality. M5-based simulations by Theodorou et al. (2025) show that demand patterns, replenishment rules, holding cost, and lost-sales penalties shape this relationship. The present analysis therefore tracks stockout rate, service level, lost sales, average inventory, replenishment frequency, and total cost alongside model accuracy.

This distinction matters in smart warehousing, where managers must balance service reliability against cost. A method that lowers prediction error but pushes inventory too high may not suit items with expensive storage. The same method can be valuable when lost sales, customer dissatisfaction, or fulfillment failure cost more than carrying additional inventory.

The analysis therefore treats forecasting as an input to a decision rather than an end in itself. A downstream replenishment simulation connects model output with inventory availability, lost sales, ordering activity, and total cost.

3. Data and Methodology

3.1 Data and Sample

The analysis draws on the public M5 Forecasting dataset released through Kaggle (2020) for the M5 Accuracy competition. It includes daily unit sales, product hierarchy, store and state information, calendar variables, event indicators, SNAP indicators, and selling prices. The sample is limited to the FOODS category in California store CA_1 and to the 100 SKUs with the highest training-period sales. This keeps the analysis manageable while retaining products with enough activity for forecasting and inventory simulation.

The data are divided chronologically to avoid information leakage. The training period covers d_1 to d_1885. The validation period covers d_1886 to d_1913 and is used for moving-average window selection and validation error estimation. The final testing period covers d_1914 to d_1941, corresponding to a 28-day out-of-sample horizon. Daily unit sales are the target variable. Forecasting features include lagged sales, rolling means, selling price, weekday, month, event indicators, SNAP indicators, item identifiers, and department identifiers.

A chronological split is essential in demand forecasting. Randomly splitting daily observations could let future patterns influence training and overstate real forecasting performance. Here, the validation period is used both to select the moving-average window and to estimate forecast-error variability for the safety-stock calculation.

The sample restriction to the top 100 FOODS SKUs in store CA_1 also has a practical justification. Food items usually have frequent replenishment needs and relatively visible service consequences. Selecting higher-volume items reduces the dominance of zero-demand

observations and makes the comparison between moving average and Random Forest more meaningful for daily warehouse decisions.

Table 1. Sample design and modelling settings

Item	Setting
Dataset	M5 Forecasting dataset; daily Walmart product-store sales with calendar and price information
Sample	California, store CA_1, FOODS category, top 100 SKUs by training-period sales
Time split	Training: d_1-d_1885; validation: d_1886-d_1913; testing: d_1914-d_1941
Benchmark model	7-day moving average selected through validation
Machine learning model	Random Forest with 200 trees, max depth 18, min leaf size 3, sqrt feature selection
Inventory policy	Reorder point simulation with 7-day lead time and 7-day coverage period

3.2 Forecasting Models and Accuracy Metrics

The moving average forecasts demand from the previous seven days and does not use price, event, or calendar features, making it a transparent benchmark. Random Forest predicts daily sales from lagged sales, rolling means, selling price, weekday, month, SNAP indicators, event indicators, item identifiers, and department identifiers. It is trained only on the training period and evaluated on the test period.

The Random Forest model uses lagged sales, rolling averages, selling price, weekday, month, SNAP indicators, event indicators, and product identifiers. Lag features capture demand persistence, rolling averages represent recent demand levels, price captures market variation, and calendar variables represent weekly or event-related patterns. All lag and rolling variables are constructed from past observations only, so the prediction date itself is not used in feature calculation. The model was implemented using the scikit-learn machine-learning library described by Pedregosa et al. (2011).

Random Forest suits this application because it models nonlinear relationships without strong parametric assumptions, handles mixed feature types, and can be implemented with standard Python libraries. It is a practical choice when a study needs more flexibility than a moving average but does not require the tuning and computational burden of highly complex models.

Forecasting performance is evaluated using mean absolute error (MAE), root mean squared error (RMSE), and weighted absolute percentage error (WAPE). WAPE is used as the main percentage-based measure because retail data often include zero or low-demand observations. Unlike MAPE, WAPE remains defined when some daily actual values are zero as long as total actual demand is positive (Hyndman & Koehler, 2006).

3.3 Replenishment Simulation and Cost Evaluation

The second stage evaluates whether forecast improvements translate into inventory value. For each SKU and forecasting method, the reorder point equals forecast lead-time demand plus safety stock. Lead time is set to 7 days. Safety stock is calculated from validation-period forecast error variability using a service protection coefficient of 1.65, representing a level close to 95% under a normal approximation. The same replenishment logic is applied to both methods so that differences in outcomes reflect differences in forecast signals.

The simulation follows a reorder point logic because this policy is widely used in inventory management and is easy to explain. In practical terms, the warehouse places a replenishment order when inventory position falls below a threshold determined by expected lead-time demand and safety stock. This rule links the forecast directly to ordering decisions and allows the study to observe how different forecasts change service and cost outcomes.

Cost evaluation includes holding cost, stockout penalty, and fixed ordering cost. This structure is simple, but it captures the core trade-off faced by warehouse managers. Holding more inventory can protect service reliability, but it consumes storage capacity and capital. Holding less inventory reduces carrying cost, but it increases the risk of lost sales and fulfillment failure. Sensitivity analysis is therefore necessary because the preferred forecasting policy can change when the relative cost parameters change.

The simulation observes inventory position at the beginning of each period. If inventory position falls below the reorder point, a replenishment order is placed and arrives after the lead time. Daily realized demand is then satisfied from available inventory. Unmet demand is recorded as lost sales. Inventory performance is measured by stockout rate, service level, fill rate, lost sales, replenishment count, average inventory, and total cost. Baseline total cost includes holding cost, stockout penalty cost, and fixed order cost. The baseline parameters are $h = 1.0$, $p = 10.0$, and $K = 20.0$. Sensitivity analysis varies holding cost and stockout penalty to test when Random Forest becomes economically attractive.

4. Results

4.1 Forecasting and Service Performance

Across all forecasting metrics, Random Forest outperforms the moving-average benchmark. MAE falls from 4.392 to 3.863, RMSE from 6.644 to 5.617, and WAPE from 39.82% to 35.03%, a relative WAPE improvement of about 12.05%. The result suggests that lagged demand, rolling averages, price, calendar, event, and product-level variables add useful predictive information.

The lower RMSE also matters operationally because RMSE places more weight on large errors. In replenishment settings, those errors can create severe stockouts or unnecessary inventory. Random Forest therefore improves average error while also reducing some of the larger deviations that disrupt daily operations.

The service-oriented inventory outcomes move in the same direction. The stockout rate decreases from 3.04% under the moving average policy to 2.43% under the Random Forest policy. Lost sales fall from 724 to 537 units, a reduction of 187 units or approximately 25.83%. Service level improves from 96.96% to 97.57%, and fill rate rises from 97.66% to 98.26%. Replenishment count also decreases from 273 to 254, suggesting that the machine-learning policy produces more stable replenishment signals while improving availability.

The percentage changes may appear moderate, but they arise over only 28 days and 100 SKUs. Reducing lost sales by 187 units shows that better demand signals can produce visible service gains even in a short operating window. Across a larger network or a longer horizon, such differences could accumulate into more substantial service and revenue effects.

Table 2. Forecasting accuracy and inventory service outcomes

Model	MAE	RMSE	WAPE	Stockout rate	Fill rate	Lost sales	Repl. count
Moving Average	4.392	6.644	39.82%	3.04%	97.66%	724	273
Random Forest	3.863	5.617	35.03%	2.43%	98.26%	537	254
Improvement	12.05%	15.45%	12.05%	0.61 pp	0.60 pp	25.83%	6.96%

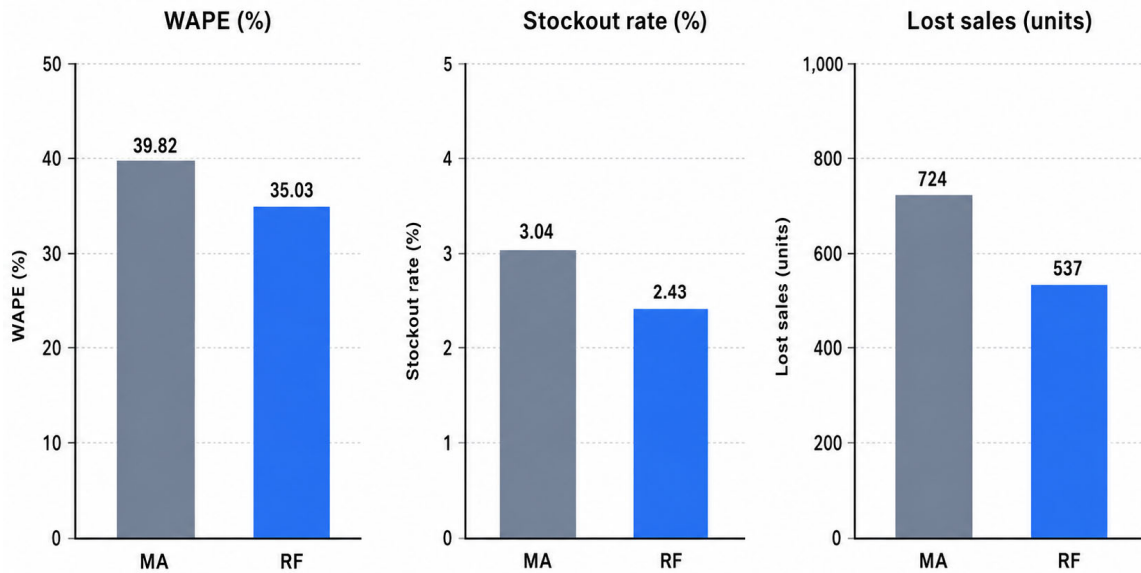


Figure 2. Comparison of forecasting accuracy and inventory service outcomes.

4.2 Baseline Cost and Sensitivity Results

The cost result is less one-sided. Random Forest improves accuracy and service, but average inventory rises from 82.78 to 86.78. Under the baseline cost setting, total cost increases from 244,494 to 253,429, a disadvantage of about 3.65%. This is the usual inventory trade-off: better availability may require a larger buffer, and whether that buffer is worthwhile depends on holding cost relative to the stockout penalty.

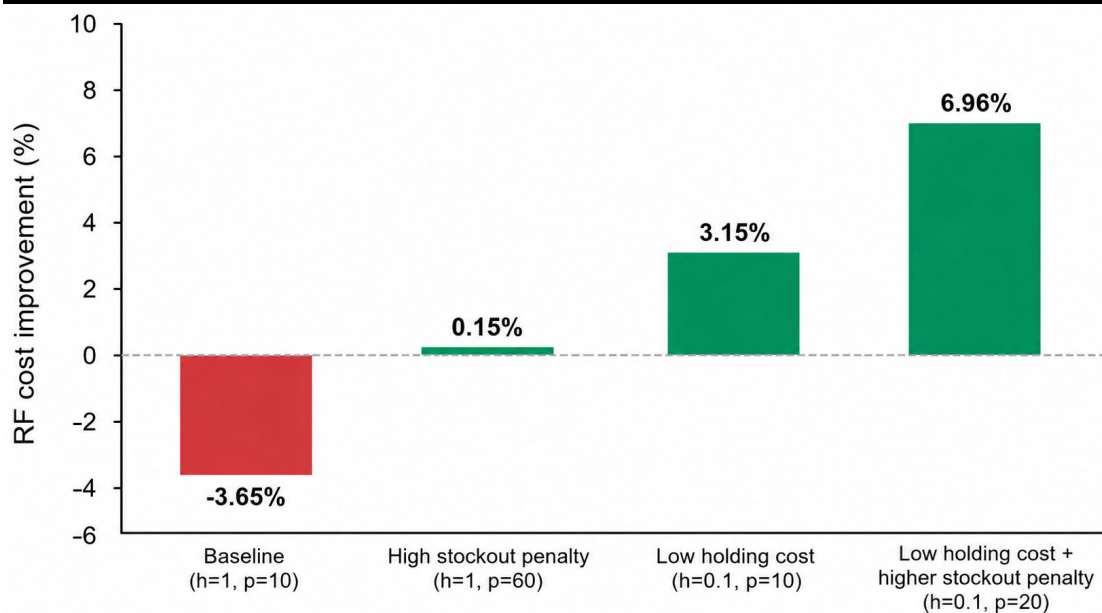
The sensitivity tests show where the balance changes. When the stockout penalty rises from 10.0 to 60.0 and holding cost remains at 1.0, Random Forest becomes slightly cheaper, reducing total cost by 0.15%. When holding cost falls to 0.1 and the stockout penalty remains at 10.0, the cost reduction is 3.15%; with low holding cost and a stockout penalty of 20.0, it reaches 6.96%. Machine learning is therefore most attractive where stockouts are costly or additional inventory is relatively inexpensive.

Rather than weakening the case for machine learning, the sensitivity results identify when it is economically preferable. Higher stockout penalties make avoided lost sales more valuable, while lower holding costs make the extra inventory needed to protect service less expensive. Adoption of Random Forest-based replenishment should therefore follow product economics rather than be applied uniformly across all SKUs.

For example, products with high margins, promotional importance, or strong customer-service expectations may justify a service-protective policy even if average inventory increases. In contrast, slow-moving items, low-margin products, or products with high storage burden may be better served by a simpler forecasting rule unless the machine-learning policy is adjusted to control inventory accumulation.

Table 3. Cost sensitivity analysis

Scenario	h	p	MA cost	RF cost	RF improvement
Baseline	1.0	10.0	244,494	253,429	-3.65%
High stockout penalty	1.0	60.0	280,694	280,279	0.15%
Low holding cost	0.1	10.0	35,879.4	34,747.9	3.15%
Low holding cost + higher stockout penalty	0.1	20.0	43,119.4	40,117.9	6.96%

*Figure 3. Cost sensitivity of Random Forest replenishment under alternative cost settings.*

5. Discussion

The findings suggest that smart warehousing is not only about automation or digital infrastructure; it also depends on data-driven decision support. Demand forecasting links analytics with replenishment, inventory positioning, and fulfillment reliability. In this study, Random Forest provides a more accurate short-term demand signal and is associated with lower stockout risk and fewer lost sales.

Higher forecast accuracy does not automatically mean lower total cost. Inventory systems turn forecasts into decisions through lead time, safety stock, order-up-to levels, holding cost, and stockout penalty, so a model can improve service while increasing average inventory. Managers should therefore consider statistical and operational indicators together. MAE, RMSE, and WAPE need to be read alongside service level, fill rate, lost sales, average inventory, replenishment frequency, and total cost.

Model adoption should be selective. Machine-learning forecasting is likely to add most value for SKUs with volatile demand, high margins, high substitution risk, or strict fulfillment requirements. For stable products with low service penalties and high holding costs, a moving average may be sufficient and easier to maintain. Cost-sensitivity analysis should therefore be part of the evaluation before a firm deploys machine learning across all products.

5.1 Managerial Implications

The first managerial implication is that warehouse managers should evaluate forecasting models through operational key performance indicators. MAE, RMSE, and WAPE are useful for technical comparison, but they should be accompanied by stockout rate, fill rate, lost sales, average inventory, replenishment count, and total cost. This broader evaluation prevents firms from selecting a model that looks accurate but performs poorly under their cost structure.

The second implication is that machine-learning adoption should be segmented by product type. Random Forest-based replenishment is more promising for volatile, fast-moving, high-margin, or service-sensitive SKUs. For stable products with low shortage consequences, a moving average may remain sufficient and easier to maintain. In practice, a smart warehouse does not need one forecasting method for all products; it can match model complexity with product importance and demand uncertainty.

The third implication is that sensitivity analysis should become a routine part of forecasting implementation. Before adopting a new model, managers should test alternative holding-cost and stockout-penalty assumptions. This helps identify whether a model reduces total cost, improves service at an acceptable cost, or simply shifts cost from stockouts to inventory holding.

6. Conclusion

The study tested whether machine-learning demand forecasts can improve replenishment decisions in smart warehousing. Using public M5 retail sales data, it compared a 7-day moving average with Random Forest and used both forecasts in a reorder point-based simulation. This made it possible to evaluate forecast accuracy alongside stockout rate, lost sales, service level, average inventory, replenishment count, and total cost.

Three points emerge. Random Forest improves forecasting accuracy, reducing WAPE from 39.82% to 35.03%, and it improves service: stockout rate falls from 3.04% to 2.43% while lost sales drop from 724 to 537 units. Its cost effect is conditional. Under the baseline setting, Random Forest carries more inventory and has a slightly higher total cost; under higher stockout penalties or lower holding costs, it becomes economically attractive. Forecasting models should therefore be adopted as decision-support tools that connect prediction with service and cost outcomes.

The study has limitations. It focuses on one M5 sample, namely FOODS products in store CA_1 and the top 100 SKUs by training-period sales volume. It compares only two forecasting methods and uses a simplified reorder point rule with stylized cost parameters. Future studies could extend the analysis to other stores, categories, forecasting models, and more realistic replenishment constraints such as supplier capacity, minimum order quantities, perishability, multi-echelon allocation, and dynamic lead times.

Despite these limitations, the paper provides a concise empirical framework that can be extended by future research. Additional studies could compare Random Forest with gradient boosting, XGBoost, LightGBM, or probabilistic forecasting models. Future simulations could also consider supplier constraints, minimum order quantities, perishability, shelf-life limits, multi-echelon allocation, and dynamic lead times.

The contribution lies in a reproducible path from public retail data to operational decisions: forecasts feed into replenishment rules, and those rules are assessed through both service and cost indicators. This approach is relevant to logistics, smart warehousing, supply-chain analytics, and data-driven operations management.

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Psychological Sciences

History of qualitative method and its significance for psychological research

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Abstract

This article discusses the historical development and contemporary importance of qualitative research in psychology. Although there is a wealth of literature on qualitative research methodology, questions still remain about their use and validity. The article traces the evolution of qualitative methods starting from ancient philosophical traditions to modern psychological practice. The important contributions of researchers such as Gordon Allport, Abraham Maslow, and Lawrence Kohlberg are discussed. We also reviewed in short of how qualitative research was used by D. Uznadze and Georgian researchers. The analysis given in this article shows that qualitative research provides essential insights into human behavior and experience that complement quantitative approaches.

Keywords: qualitative research, research methodology, mixed methods, psychological research

Introduction

A great deal has been written and said about qualitative research—and rightly so, given that numerous fields successfully employ this method, creating the impression that there is nothing left to prove and that everything has long been well understood. However, the need for this specific article arises from questions that continue to be raised; these questions spark student interest in the method yet require further clarification.

"How do you know that this is truly the case and that it is the truth?" – this is the foundation of qualitative research. We all know what is true and real, yet we often perceive different realities, shaped by cultural, socio-economic, gender-related, linguistic, age-related, and other types of differences (Camic, 2003)

According to Frederick Wertz, "the greatest paradox of qualitative research is that, despite the interest in it, very little information exists regarding its history" (Wertz, 2014). The primary aim of this article is to answer the question: what is qualitative research—what is it like, and how is it used in psychology?

The Historical Development of Qualitative Research

Early Foundations

It is undisputed that qualitative research in psychology emerged after the discipline gained the status of an independent science in 1879. In reality, however, the history of qualitative research dates back to antiquity—specifically to the works of Aristotle. The qualitative tradition of naturalism developed and entered the field of psychology through the work of Darwin (1871–1872).

Freud employed a qualitative research method when investigating psychopathology (Freud & Breuer, 1895), yet standards for qualitative research had not been established until a later time.

The Allport Era and Formalization

In 1940, the Committee on Appraisal of Research—led at the time by Edmund Day (Director of the Social Sciences Division of the General Education Board in the U.S.)—approached the U.S. Social

Science Research Council with a request to improve the quality of research conducted in the social sciences.

The committee asked Gordon Allport to examine data revealing the "self"—material that, consciously or unconsciously, provides information about the author's mental life, structure, and dynamics (Allport, 1942).

In 1942, G. Allport's review and evaluation was published as a monograph, addressing such matters as autobiographies, questionnaires, verbal records (such as interviews), diaries, journals, letters, and expressive behavior or works of art.

According to G. Allport, 200 to 300 authors in the field of psychology used personal documents, but only about a dozen authors thought about the method they used. Allport's most important and significant discovery was that, despite the fact that personal documents were processed with great skill and creativity in psychology. Nevertheless, less attention was paid to methodological issues such as sorting and selection, observer reliability, validity, and objectivity.

Allport concluded his review with the three recommendations:

1. Psychologists should continue to develop qualitative methods by conducting bold and radical experiments.
2. These methods must be evaluated critically and carefully, particularly regarding issues of sampling, interpretation, reliability, and validity.
3. Strict measures should be taken against those scholars who prohibit and condemn the use of personal documents and demand that qualitative research methods be used solely for formulating hypotheses.

Continued Development Despite Initial Resistance

Although Allport's monograph did not achieve widespread circulation or recognition, qualitative research continued. A clear example of this is Kohlberg's dissertation—defended in 1954 and published in 1994—which is only now receiving due methodological recognition (Wertz et al., 2011).

The case of Abraham Maslow is also noteworthy: when he submitted his work for publication, it was rejected by many psychology journals, yet he persevered, believing his methods to be scientifically valuable and reliable.

Recognition and Integration

By the 1970s and 1980s, qualitative methods were already gaining widespread recognition (Giorgi, 1970; Gergen, 1973; Polkinghorne, 1984). The term "qualitative" entered scientific usage in the 1980s and has been regularly employed in scientific journals since the 1990s (Rennie, Watson, & Monteiro, 2001).

Qualitative research used by D. Uznadze (1886 – 1950) and Georgian researchers

It was known for Georgian scientific school, that Qualitative research in sociology and psychology focuses on gaining an in-depth understanding of human behavior, motives, and social contexts. Dimitri Uznadze (the creator of set theory) himself primarily focused on experimental research and the method of fixed set; however, his theory of set and the concept of objectification are widely used as a theoretical framework in qualitative research. It helps us understand how a person's "set" (predisposition) determines their perception and interpretation of reality.

When researchers employ qualitative approaches in conjunction with Uznadze's concepts ("set", need, objectification), the research process comprises the following stages:

- **Interpretative analysis:** comprehending the experiences of the respondents based on their own internal needs and the specific characteristics of their consciousness.
- **Study of subjective perceptions:** Identifying the respondent's individual position, attitude, and the psychological "readiness" formed prior to acting within a specific social environment.
- **Use of qualitative tools:** Semi-structured and in-depth interview methods employed by the researcher to uncover the motives underlying behavior.

Modern Application and Methodology

Current Status

- Qualitative research is widely recognized and studied, and is just as important as quantitative research.
- It is used to gain insight into complex experiences and cultural contexts, and to deepen understanding of theories regarding individual behavior.
- Qualitative research is increasingly used to refine quantitative findings and explain specific psychological phenomena.

According to the updated McLeod (2025): "Qualitative research works with words, meanings, and content, and also examines experiences" (McLeod, 2025). "Quantitative data involves numerical information—thereby testing hypotheses and identifying patterns—whereas qualitative data is descriptive in nature, exploring in depth language, perceptions, feelings, and the types of experiences that are difficult to quantify."

Distinguishing Characteristics

Quantitative research employs statistical methods and aims to obtain objective, empirical data that can be measured and expressed numerically. It tests hypotheses, identifies patterns, and often holds predictive value.

Qualitative research relies on subjective experiences and attitudes; its goal is to provide a detailed description and uncover in-depth facts and data regarding the phenomenon under study.

- Qualitative research answers the questions "why" and "how" and explores ideas.
- Quantitative research answers the question "how many."

Key Characteristics of Qualitative Research

Natural Context

Qualitative research and observation are conducted in a natural setting, enabling the researcher to study the authentic, natural behavior and experiences of the participants.

The Participant's Viewpoint and Perspective

Participants describe their viewpoints and experiences using their own natural language. This interactive process enables the researcher to gain insight into the participant's reality and essence.

Researcher and Participant

The researcher interacts directly with participants; their presence and interaction are essential, as qualitative data are generated through active participation.

Flexible Design

The qualitative research process adapts and evolves as the study progresses. Researchers adjust their methods step-by-step in response to the unfolding process and shift their focus to suit the situation, taking into account new circumstances and factors that emerge.

Data-driven theories

Theories and conclusions are formulated and developed based directly on the data obtained, rather than by testing pre-existing theories.

Qualitative research methods

In-depth interview

Open-ended questions and conversations that allow participants to share their thoughts, perspectives, feelings, and experiences in their own words.

Focus groups

Group discussions that explore and examine participants' perspectives regarding specific topics and experiences.

Observation

The researcher closely observes and records behaviors, interactions, and social practices.

Diaries and journals

Participants provide written descriptions of personal experiences, emotions, or events.

Case study

An in-depth study of an individual, group, or situation, aimed at understanding a complex phenomenon within a real-life context.

Ethnography

A detailed description and analysis of the daily lives and customs of cultures, societies, and groups.

Data analysis techniques

Thematic analysis

Researchers examine qualitative data and identify recurring ideas, concepts, or patterns, which are referred to as themes.

Content analysis

This method involves the systematic organization and categorization of text, speech, or verbal responses.

Grounded theory

Researchers use data obtained through observation to formulate new theories or explanations.

Discourse analysis

Researchers also analyze spoken and written language within a social context.

Strengths and Weaknesses

Strength of Qualitative Research

A strength of qualitative research is its ability to provide precise answers to specific research questions. While quantitative research allows for drawing general conclusions regarding human behavior, qualitative research provides a detailed description of a specific group's behavior in a specific situation.

Limitations

Small sample size: Qualitative research involves small groups, which limits the ability to generalize findings to the broader population.

Subjectivity and bias: Qualitative research is context-dependent, which limits the transferability of findings to different contexts and groups.

Here, we would like to briefly outline the strengths of quantitative research to make it easier to explain why researchers prefer using mixed methods.

Strengths of quantitative research:

A strength of quantitative research is the description, prediction, and control of research variables through the processing of numerical data. The goal of quantitative research is to establish causal relationships between variables and to generalize findings to a broader population.

The aim of quantitative research is to identify general patterns of behavior.

Mixed-methods approach

Many researchers conclude that combining both approaches and employing a mixed-methods strategy yields better results—using qualitative research to formulate hypotheses and quantitative research to test them (Todd, Nerlich, McKeown, & Clarke, 2004).

Qualitative and quantitative results should complement each other to create a meaningful and coherent whole in relation to the research object and the research objective (Sagadin, 2004).

Advantages of mixed methods

The use of mixed methods is particularly effective for analyzing and explaining complex topics and is widely applied in fields such as psychology, education, sociology, healthcare, and business and marketing.

Conclusion

Qualitative methods are employed across various disciplines—such as anthropology, sociology, education, the medical sciences, history, and psychology—enabling researchers to grasp the essence of complex phenomena.

The historical development of qualitative research in psychology demonstrates its essential role in understanding human behavior and experience. From its philosophical origins to its contemporary applications, qualitative research provides insights into the subjective dimensions of psychological phenomena.

Despite its successful application in other disciplines, the persistence of questions regarding the validity and use of qualitative research in psychology points to the need for ongoing education and methodological development.

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Historical Sciences

Сұлтанбек Қожанов пен Сейітқали Меңдешевтің 1924 жылғы ұлттық- аумақтық межелеу жөніндегі ұстанымдары

Бисембайұлы Мирас

Әл-Фараби атындағы ҚазҰУ PhD-докторанты, Алматы, Қазақстан

Аңдатпа. 1924 жылғы Орталық Азиядағы ұлттық-аймақтық межелеу саясатының қазіргі Орталық Азия елдеріне ықпалы және қабылданған шешімдердің себептері мен орын алған тарихи шешімдерге баға жеткілікті деңгейде берілмеді. Түркістан Кеңестік Автономиялық Республикасының ыдырауы нәтижесінде орын алған жер мәселесі ұлттық және аграрлы мәселелерді де тудырды. Қазақ, өзбек, қырғыз, қарақалпақ халықтарының зиялылары бұл іске араласқан. 1924-1925 жылдары қазақтың жерін қалпына қосу ісінде ең көп көзге түскен азаматтардың қатарына Сұлтанбек Қожанұлы мен Сейітқали Меңдешұлын жатқызуға болады. Олардың көзқарастарын салыстыра талдау мақаланың басты мақсаты мен нысанасына айналды. Саяси қайраткерлердің пікірлері архив құжаттарында табылып, барынша дерекнамалық талдау жасалды. Екі азаматтың пікірлеріне баға беру үшін салыстармалы талдау пайдаланылды. Әртүрлі конференцияларда орын алған сан түрлі пікірлерді талдау үшін жүйелілік-құрылымдық талдау, ал әр оқиғаны тізіп жеткізу үшін мәселелі-хронологиялық талдау қолданылды.

1924 жылы Қазақстанның қазіргі оңтүстік облыстарын Кеңестік Қазақстанға қосу саясаты басталды. Сырдария облысының Қазалы, Ақмешіт, Түркістан, Шымкент уездері, Әулиеата уезінің көп бөлігі, Ташкент, Мырзашөл уездерінің бір бөлігі, Самарқан облысы, Жизақ уезінің бірнеше болысы, Жетісу облысының Алматы, Жаркент, Лепсі, Қапал уездері, Пішпек уезінің бір бөлігі Қазақстанға қарады. Республика аумағы 2,7 млн шаршы шақырымға жетті. Жер көлемі шамамен 30 пайызға артты. Халық 5 млн 230 мыңға жетіп, барлығы 1 млн. 400 мыңға көбейді. Қазақтар 1926 жылғы санақ бойынша 61,3 %-ды құрады [1]. Әсіресе, оңтүстік өңірлерді қосуға Сұлтанбек Қожанұлы мен Тұрар Рысқұлұлы белсенділік танытты. Ал 758 000 шаршы км жерді құрған Қарақалпақ автономиясын Қазақстанға Сейітқали Меңдешұлы бастаған комиссия қосады [2].

Бұл 1924-1925 жылдардағы келіссөздердің нәтижесінде қазақ азаматтарының қол жеткізген жетістіктері десек те болады. Алайда, жер дауы нәтижесінде айырылып қалған жерлер де болды. Ол жерлердің басқа елдерге кетуіне экономикалық себептер болды.

Қазақ облыстық комитетінің 2 пленумы 1924 жылы 27 қыркүйекте болды [3, 11-п.]. Жиналыстың хаттамасында Түркістан Республикасымен шекара сол күйінде қалды, ал Қырғыз Республикасымен шекара мәселе біржола шешілді делінді. Сырдария облысынан Қырғыз Республикасына кейбір Әулиеата уезінің болыстары, Жетісу облысының екі уездері және Пішпек уезінің үлкен бөлігі өткен.

Ташкент қаласының мәселесі ерекше қаралған. Ташкент қаласында өзбектер көп тұрғанмен, облыста олардың үлесі тек төрттен бір бөлігін қамтыған. Сейітқали

Меңдешұлының айтуынша, олар Ташкентті Кеңестік Қазақстанға бергісі келді. Бірақ бұл Орталық Комитеттің Ташкенттің арал күйінде сақтау қажет деген пікіріне қайшы болғандықтан, олар өз талаптарынан қайтуға көнді. С.Меңдешұлы ұлттық-аумақтық межелеу барысында Қазақ АКСР-і Өзбек Республикасына Ташкентке шығатын аумақтық дәліз беруге мәжбүр болғанын атап көрсетті. Оның айтуынша, бұл шешім құрамалар қоныстанған Анген ауданын Өзбек Республикасына берумен қатар, қазақтар тығыз қоныстанған Қарқорған және Чентыпин¹ (архивтегі атау) болыстарынан бас тартуға алып келді. Онымен қоса, Ташкент қаласы маңындағы болыстар Өзбекстанға кеткендіктен, Өзбекстанға Ташкентке барар жол ашылған болатын. Бірақ комиссия Сейітқали Меңдешұлының талаптарын қабылдамай, құрамалар қоныстанған және тек қазақтар өмір сүрген Шыршық өзені бойындағы 5 болыстар Өзбекстан Республикасына кетіп қалды. [3, 12-п.].

Өзбекстан Республикасына Ташкент маңындағы 3 болысты ұлттық белгілерге қарап шегендеу ұсынылды. Тек Шыназ (Чинаусская) болысы ғана Қазақстан Республикасына өту керек еді. Ал Александровская және Қосқорған болыстарын қосу мәселесі күн тәртібінде ашық қалды.

Мырзашөл уезін Қазақстанға қосу ісі ерекше қаралды. Бұл уезд қазақтың егіс алқаптарын суаруға арналған ең маңызды әрі құнарлы жер болғандықтан қазақтарға беру талап етілді. Сейітқали Меңдешұлы Өзбекстанға оңтүстіктегі 3 болыс пен тағы да Джабердин² болысын беріп, қалған болыстарды Қазақстанда қалдыруға тырысты. Алайда, комиссия 4 болысты Қазақстанға беруге қарсылық танытты. Онымен қоса, комиссия Әмудария мен Ходжейлі(Қожалы) облыстарын біріктіріп, Қарақалпақ автономиясын құруды ұсынды. Комиссия түрлі ұсыныстарды ұсынғанмен, түгелімен қазақтар мекен еткен 5 қазақ болыстары Өзбекстан Республикасына қарап, мәселе шешілмеген еді [3, 13-п.].

Ақыры комиссия сөзінен айнып, Мырзашөлді Өзбекстанға қалдырып, тек 1 ғана болыс Қазақстанға қарады. Бұған Сейітқали Меңдешұлы ызаланған еді. Оның ойынша, жер суару каналдары бар Мырзашөл уезін Өзбекстанға беріп жіберу Оңтүстік Қазақстанды әлсіретіп, экономикалық тұрғыдан Өзбекстанға тәуелді етеді. Бұл өңірге Сырдария облысының 70 пайыз қаражаты бөлінгендіктен, осыдан бастап осыншама көп қаражат Өзбекстанға кететінін білдірген. Одан басқа, Ташкент маңындағы құрылыстарды басқару, су электр станса мен Ташкенттегі жылқы зауытын кімге беру ісі үлкен мәселеге айналды. Ол зауыттарды басқаратын басшыларды табу күн тәртібіне қойылды [3, 14-п.].

Онымен қоса, 300 мың қазақтар Бұхараға көшіп кеткен еді. Сейітқали Меңдешұлының айтуынша, олар зәбір-жапа шегіп, жергілікті биліктен қорлық көрген. Сол жердегі қазақтар жеке облыс құруға шақырды. Бұл мәселені де ол шешуге шақырды [3, 15-п.].

Сейітқали Меңдешұлы Сырдария облысына қарасты Шурахан ауданын Қарақалпақ облысына беру туралы мәселе көтеру қажет деген ойымен бөлісті [3, 16-п.].

Орталық Азияны ұлттық-аумақтық межелеу және Қазақ облысын Қазақ Кеңестік Социалистік Республикасына қосу туралы Сұлтанбек Қожанұлы қосымша баяндама оқыды. Ол өз кезегінде: «Мен Облыстық комитеттің Ташкент қаласын толық құрамымен бізге қосу жөніндегі бұрынғы өтінішін қолдаймын. Алайда, бізге Ташкент қана емес, Шымкент те берілмейтін сияқты. Сонымен қатар, Әулиеата немесе Қарамыш қалай бөлінсе де, біздің Шымкент үшін күрес жүргізуімізге тура келетін тәрізді» деп мәлімдеді [3, 23-п.].

Одан кейін Сұлтанбек Қожанұлы Сейітқали Меңдешұлының ұсыныстарына пікір білдіріп, жаңа ұсыныстарды енгізді:

«Мен Қазақ КСР орталығының Орынборда орналасуын, оның географиялық жағдайына сәйкес келмейтіндіктен, мүлдем қолайсыз деп есептеймін. Сонымен бірге, Ташкент мәселесін қайта қарау қажет. Ташкентті Қазақ Кеңестік Социалистік Республикасының орталығы ретінде беру туралы мәселені қайта қарауды РК(б)П Орталық Комитетінен сұрау

қажет. Ташкенттің ескі қаласын Өзбек Кеңестік Социалистік Республикасына, ал жаңа қаласын Қазақ Кеңестік Социалистік Республикасына беру мүмкін деп есептелсін. Одан басқа мынадай қаулылар қабылданды:

1. Соңғы Бүкілтүркістандық жиында қырғыз (қазақ) тобының білдірген тілегіне сәйкес, Бұхара Қырғыз автономиялық облысын Өзбек Кеңестік Социалистік Республикасының құрамында құру қажет деп есептелсін [3, 25-п.];

2. Әмудария облысының негізінде Қазақ КСР құрамында Қарақалпақ автономиялық облысын құру қажет деп есептелсін;

3. Қарақырғыздардың Хорезмдегі облысына қатысты келетін болсақ, Шурахан уезін бөліп алып, оны Өзбекстанға беру мүлдем жол беруге болмайтын шешім болып табылады; Одан кейін Юсупов жолдас қосылып, келесідей қарар қабылдады:

4. Зеленский жолдас төрағалық еткен аумақтық комиссияның шешімдерін бекітуді және Ташкент уезінің алты болысына қатысты мәселені қайта қарауды талап етеді;

5. Экономикалық мәселелер бойынша Қырғыз (Қазақ) өкілі енгізген ерекше пікір қоса беріледі [3, 26-п.];

Сұлтанбек Қожанұлы Ташкенттің қазақтардың тарихи жері әрі Мырзашөл мен Жизақ уездерін байланыстырған қала екенін дәлелдеуге тырысты. Ол Ташкент бойында сарттар көп тұрғанмен, олар қазақтарға тәуелді екенін көрсетті [4].

Ол Түркістан өңірінде мекен еткен халықтар өздерін біресе түрік, біресе шағатай, біресе өзбек деп атап, толыққанды ұлттық бірегейлік қалыптаспағанына тоқталған. Ал құрамаларды өзбек деп жазу үлкен тарихи қателік деп білді. Құрамалар «Ақтабан шұбырынды, алқакөл сұлама» кезінде Өзбекстан жеріне жер аударған үйсін, дулат, шаңышқылы, рамадан, жағалбайлы, тама және басқа рулардың өкілдері екенін дәлелдеген [5, 23 б.]. Оған қарамастан, Ташкент Өзбекстанға беріліп кетті.

1924 жыл Қырғыз (Қазақ) ОАК IV шақырылымының нәтижесінде Қазақ КСР КСРО құрамына шарттық негізде бөлінбейтін (біртұтас) республика ретінде кіруге тиіс деген қарар қабылданды [3, 32-п.].

1924 жылы 17 қазанда астананы көшіру үшін кезекті отырыс өтеді. Мұхтар Саматұлы астананы Ақтөбеге көшіруді ұсынса, Сұлтанбек Қожанұлы Шымкентті, Сейітқали Меңдешұлы Ақмешітті ұсынды. Санжар Асфендияр, Ораз Жандос Сұлтанбек Қожанұлының ұсынысын қолдаған. Бірақ Шымкент Ташкентке тым жақын болғандықтан, бұл ұсыныстан бас тарту туралы шешім қабылданды. 1924 жылы желтоқсанда Орынборды астана етіп сақтау ұсынылды. Сейітқали Меңдешұлы астананы Ақмешітке немесе Семейге көшіру керек деді. Ақырында Сұлтанбек Қожанұлы өз пікірін өзгертіп, астананы Ақмешітке көшіруді ұсынды. 1925 жылы 6 сәуірде Орынбор Қазақ Автономиялық Кеңестік Социалистік Республикасынан шығып, РКФСР құрамына енді [1].

Қорытындылай келе, ұлттық-аймақтық межелеу кезінде Сейітқали Меңдешұлы мен Сұлтанбек Қожанұлы жер мәселесін шешу үшін ұлттық көзқарастарды алдыңғы қатарға қоюға тырысты. Ал Кеңес Одағы экономикалық мәселелерді алға қойып, маңызды жер-су аймақтарын Өзбекстанға беріп, өңірде бәсекелестік тудыруға тырысты деуге болады. Мырзашөл уезі мен басқа болыстардың Өзбекстанға беріп жіберуі, Қарақалпақ облысының құрылып, кейін РКФСР, одан кейін Өзбекстанға қарауы Орталық Азияда егіншілікпен айналысатын халыққа артықшылық берді деп қорытуға болады.

Ескертпелер

¹Архив құжатындағы «Чентыпинская волость» атауының «Уч-Тепинская волость» (Үштөбе болысы) болуы ықтимал.

²Архив құжатында «Джабердинская волость» деп көрсетілген. Бірақ бұл атау ешқандай да карталарда кездеспейді.

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Agricultural Sciences

Внедрение амаранта в наших условиях

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Люди издавна использовали масла, полученные из ряда дикорастущих и культурных растений, в лечебных целях в качестве ценных лекарственных средств. Эти масла применялись при лечении ожогов и ран, а также при приготовлении мазей и суспензий.

В последнее время для получения лекарственных масел стали использовать и новые, нетрадиционные растения. Одним из таких растений является американский амарант, который был завезен нами в Азербайджан в 1987 году.

Амарант с древних времен используется в народной медицине в качестве лекарственного растения для самых разных целей, однако химические соединения амаранта, обладающие фармакологической активностью, изучены недостаточно или вовсе не изучены. В качестве лекарственного растения активные компоненты амаранта представлены преимущественно фенольными соединениями. К ним относятся антиоксиданты (витамины группы В, токоферолы), флавоноиды (кверцетин, тритерпены и рутин), гликозиды, алкалоиды (амарантин, бетанин), витамины, антидиуретические соединения, пектины и т. д.

Поскольку надземные части амаранта (стебель, листья и цветки) обладают антибактериальными свойствами, их используют в домашних условиях в виде настоев и экстрактов при простуде и коклюше.

Наше исследование посвящено изучению выращивания, развития, биологии, урожайности и биохимических свойств пяти сортов амаранта («Харьковский», «Лера», «Сем», «Ультра» и «Багряная»), завезенных из России и Украины, в условиях Азербайджана.

В настоящее время изучается акклиматизация этой новой культуры к местным условиям. Как отмечалось выше, внедрение амаранта в условиях Азербайджана — практика не очень давняя. К сожалению, проводимые эксперименты носили спорадический характер и не получили широкого распространения в сельском хозяйстве.

Однако изучение адаптации амаранта к разнообразным климатическим и почвенным условиям республики, его агрономических характеристик, а также химического состава его продуктов (листьев, стеблей и семян) дает основания полагать, что его можно использовать не только в качестве продовольственной и кормовой культуры, но и в качестве лекарственного растения.

Растение амарант, новое для нашей страны, привлекло внимание исследователей благодаря высокому содержанию сбалансированного белка, витаминов, минералов и других биологически активных веществ.

Уникальность амаранта заключается в его высокой пищевой ценности и в том, что все его части (стебель, листья и семена) пригодны для употребления в пищу.

Кроме того, исследования, проведенные в последние годы, показали, что амарант

обладает обширным потенциалом для использования в профилактике и лечении многих заболеваний.

Масло, получаемое из семян амаранта, превосходит масло облепихи по своим лечебным свойствам. Содержащиеся в нем вещества стимулируют иммунную систему организма, что является ключевым фактором в профилактике и лечении ряда заболеваний. Свойства и применение масла амаранта

Особенно привлекателен жирнокислотный состав семян амаранта. Семена богаты комплексом ненасыщенных и полиненасыщенных жирных кислот, в том числе олеиновой, линолевой, линоленовой, арахиновой и других.

Масло амаранта содержит большое количество (6–15 %) сквалена. Сквален участвует в синтезе стероидных соединений в организме человека и животных. В медицине сквален применяется при лечении онкологических заболеваний, отравлений радионуклидами, а также для укрепления иммунной системы. Сквален, содержащийся в амарантовом масле, ускоряет регенеративные процессы в организме человека.

Масло также содержит серотонин, кантин, желчные кислоты, холин, стероиды, витамины (А, группы В, D, Е, Н, Р и др.), каротины и каротиноиды.

Содержание кислот в масле, полученном из семян амаранта, составляет: пальмитиновая кислота (22,1–26,0 %), стеариновая (4,5–6,3 %), олеиновая (18,4–20,7 %), линолевая (36,5–47,3 %), линоленовая (2,4–2,9 %), арахиновая (9,1–12,1 %), миристиновая (0,5–1,1 %), а на долю пентадекановой и гептадекановой кислот приходится 0,5 %.

Существует несколько методов извлечения масла из семян амаранта: экстракция растительными маслами, экстракция органическими растворителями (диэтиловым эфиром, бензином, гексаном и т. д.), метод с использованием сверхкритического диоксида углерода (CO₂) и метод прессования. Недостатком метода экстракции масла является нагрев экстракта до 70 °С, что приводит к разрушению ряда биологически активных веществ и потере маслом своей активности в течение короткого периода времени (7–10 дней). Недостатком метода экстракции с использованием органических растворителей является остаток растворителя (запах) в полученном масле, из-за чего масло, произведенное этим способом, можно применять только наружно.

Масло амаранта укрепляет иммунитет организма и нормализует обмен веществ. Оно совместимо с любыми лекарственными препаратами и смягчает побочные эффекты, улучшая работу почек и печени.

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Philological Sciences

Jewish Anthroponyms Common in Georgia

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ABSTRACT. As is generally known, Georgian written monuments have been found since the Vth century. Available sources are interesting in many ways. Among them, centuries-old contacts of Georgia and the Georgian people with other peoples are of special importance from the cultural point of view, which should be the basis of the variety of names and naming traditions in Georgia. Jews names in Georgia form a different group, which in the lexical system of the language, with an inehauistible abundance of facts, variety of forms, specific semantics and grammatical structure, are a very interesting arena for linguistic research.

Keywords: Jewish anthroponyms, Georgian anthroponyms

In terms of prevalence in Georgia, the so-called Christian names are on the first place, the spread of which followed the introduction of Christianity and its declaration as the state religion. Most of these names are of Jewish origin. Later, names from the Eastern, Slavic and Western worlds were also widely spread in Georgia, although we still have the largest number of Jewish names.

The study of Jewish names and names of Jews common in Georgia is a very interesting area, because the influx of Jewish names into Georgia must have started in the pagan period, because the first flow of Jews appeared in Georgia at that time, in the VIth century AD. According to historical sources, the second big flow should have appeared in the first century of the new era, Georgia is still a pagan period. In particular, at that time, the translation of the Bible did not exist in Georgia yet. According to Leonti Mroveli, the Jews language must have been widespread in Georgia before King Parnavaz, that is, even before the third century AD. Probably, the influx of Jewish names should also have happened during this period. And after the spread of Christianity, the spread of Jewish names was given an even wider arena. Despite the fact that we have a 26-century history of Jewish life in Georgia, the abundance of Jewish names is not confirmed in ancient written monuments, unlike Jewish names. From the sources of this period K. Lerner mentions several of his own names, which are confirmed in various historical sources and documents. Such are, for example, Abdala, Abon| |Abona, Abram, Abramiya, Beri, Besika, Glakhua, Mamula, Mihako, Tsitsa, Elua, Shalva, Yakoba, etc. (Lerner 2008: 237-241).

In historical sources, we can find a lot of Jewish names that Georgians, including Georgian kings and nobles, were called. The fact that the general name "man" comes from the Jews "Adam" + "lan" does not seem accidental.

Jewish names are confirmed in ancient Georgian folklore, fairy tales, for example, Abesalom and Ether. Among the names of kings, Solomon and David. We can also name women's names, for example, Anna, Mariam, Salome. Of course, these names have undergone phonetic transformations in most cases, but their Jewish origin is beyond doubt. They are confirmed in the Torah and belong to the list of ancient biblical names.

Since the XIXth century, when archival and historical documents already provide us with abundant information about Jewish names. Most of the Jews names have confirmed in the Torah, which are characterized by a strong Jewish connotation and which were mostly given only to Jews: Moshe, Jacob, Mordecai, Itzik, Gershon, Sara, Fani, Kukulo, Tonya. In this regard, it is interesting that K. Lerner's reasoning. In his opinion, the number of common names among Georgian Jews is

determined. Mainly here we find traditional biblical names, most of which are decorated with the "a" suffix characteristic of the Georgian dialect (for example, Arona). (Lerner 2008: 237-241).

At the end of the XXth century, when the linguistic peculiarities of the Jews began to be studied, works on the names of the Jews also appeared. Works on Georgian Jews' own names can be found since the 70s of the last century. Among them Rs. Shamelashvili's "Georgian surnames of Jews" in the book "I will not exchange salsa for rocks" (1983), "Surnames of Georgian Jews" by Eldar Mamistvalashvili in the book "History of Georgian Jews" (1995), I. Gagulashvili's "Small Dictionary of Jewish Proper Names" (1998), "Dictionary of Surnames of Georgian Jews" (1998); Kote Lerner discusses the names of Georgian Jews in the monograph "Jews of Georgia (От Еллинизма до роздного фодолазима)". We should mention here the works of Nissan Babalishvili, which he studied according to the epitaph of the Jews (Babalishvili 1970, 1971, 1990). T. Lomtadze discusses the names of the Jews in her monographs "Kutaisuri Georgian" and "Modern Georgian sociolects". S. Gumberidze refers to the same issue. in the article "Peculiarities of the formation of human (person) names in the speech of Georgian Jews". Davit Bothera devotes a lot of space to the proper names of the Jews in his work "Sketches of the Qaids of the Jews of Rabat". Bothera wrote this letter in Israel in the 70s of the last century, through it we get a certain idea about the proper names of the Georgian Jews living in Akhaltsikhe.

Jews lived in different parts of Georgia, and depending on the parts, the same name can be found with different phonetic variants: Moses/Moshe, Yoseb/Yosef, Jacob/Iakob, Abel/Ebel, Japhet/Yaphet. The abundance of phonetically conditioned forms is especially noticeable in the oral translations of the holy books of Georgian Jews, which may be due to the influence of the Hebrew language of the translation. According to Enoch, these translations should have spread in Georgia in the XIIth century, probably parallel forms could have appeared from this period.

It can be said that one of the manifestations of the identity of Georgian Jews was their names. Indeed, the population of Georgia considered only Jewish names, for example, Moshe, Samuel, Rebecca, Abraham, Aaron, Shelemiko, Khana, Sarah... There were cases when this or that name was represented by a certain phonetic transformation. For example, Filkhazi → Finkha (substitution of L and N sonants is usual in Georgian, but the sounding of the s consonant in the auslaut is a peculiarity), Bachibaki ← Heb. Bath will enter. Here we already have a peculiarity, which is mostly related to the special pronunciation of Hebrew sounds by Georgian Jews, namely, $\beth$ inside the word is pronounced as b and not as v, as it is in Hebrew ν is pronounced as $\beth$ (q). The peculiarity of Georgian is also revealed: t and sh give us the affricate ch (Lomtadze, Enokhi 2019).

When biblical names were given to both Jews and non-Jews in Georgia, Jews self-identified in such cases. If a Georgian preferred the forms that came from Greek, for example, Isaac, Moses, Samoeli, Jacob, Anna and others (since most of the biblical books were translated into Georgian from Greek), the Jew would use the Hebrew form. For example, Yitzchak, Moshe, Samuel, Jacob, Hannah and others. It can be said that the majority of Jews in Georgia carried the Hebrew variant of biblical names (Jacob), and a smaller number carried the Georgian variant of biblical names (Jacob).

Ashkenazi and Mizrak Jews also lived in Georgia. Most of them had distinctly Jewish names, Itzik, Aron, Moshe, Gershon, Sarah, Rivka, Deborah and others, but at the same time, different names were also confirmed to them. For example, Rolf, Alfred, Ian, Rima, Jenny, Joshua, Rafael, Richard...

In the XX th century, Jewish names often became the object of ridicule, so Jews began to name their children common names in Georgia. A large part of these names were also of Jewish origin, although they can be referred to as less Jewish names, because their Jewish origin remained unknown to the public. Most of them were phonetically or morphologically transformed and over the centuries were absorbed by the Georgian language in such a way that their Georgian origin was no longer in doubt. For example, Lia, Ether, Iza, Lily, Abel, Noah, Saul, Lazarus. Mikaela,

Gabriel... Many Matgans have been recognized as names of Christian saints since the early centuries.

From the middle of the XXth century, when the Jews began to receive education en masse and were actively involved in the public and political life of the country, they tried to name their children common, fashionable names in Georgia at that time. Among them less Jewish connotations, but of Jewish origin. For example, Tamar, Lia/Lea, Eter, David, Mikhail and others. And the Jewish names were given ritually. It should be noted that Jews living in almost all countries had such Jewish names: Sarah, Deborah, Rachel, Moshe, Abraham, Aaron and others.

Among the Jews, as well as among the Georgians, it was common to give a name in honor of the deceased. So, there was an occasion when a child was named after the deceased. Also, they were often named after their grandmother or grandfather, and both Georgian children and Jews were mostly servants of their grandmothers and grandfathers. There were also frequent cases when a prominent relative was named after him.

At the same time, Jews were given Jewish ritual names, which were known only to family members, and they used the aforementioned Jewish ritual names in the synagogue.

In Georgia, Jews often used nicknames. Most of them referred to their work or physical or mental handicap. Dudgunat Gikiai, the carpenter, Itzhakai, Khakham Yonatanai, Davithai the deaf, Zilfai, the wife of Yasko the lame. Common nicknames among Kutaisi Jews were: Meramke Datoi, Kuti Shalikoi, Katsikalia Fikhoi, Eter Khbo, Shusbanda Sarai, Maro Gizhi, Yura Kulturni...

Since the 1970s, Jews began to repatriate to Israel. It is worth noting that many Jews in Israel refused to use the official name recorded in the documents and used the Jewish ritual name as their official name. Thus, instead of the names in Georgia (Paata, Natela...), Jewish names (Abraham, Khava...) were given in Israel.

The material recorded in Israel shows us that Georgian Jews have different attitudes towards names. If we group Georgian Jews according to origin, social factors, we will see that different types of Georgian Jews choose different types of names for their babies. Names are categorized according to their origin (biblical and modern Hebrew, Yiddish, and other languages), their popularity in the Jewish (Israeli) community, and the assumption by speakers of the language that someone with the name might be Jewish.

The analysis showed that the name categories of respondents and their children are closely related to their personal characteristics, such as birth decade, religiosity, origin (including time spent in Israel). We also see a connection with naming traditions, such as naming people who are living or dead. Most Jews also speak of using a Hebrew name for ritual purposes. It can be said that Georgian Jews in Israel, on the one hand, continue centuries-old traditions related to names and sometimes make some changes in it.

If in Georgia, from the 70s of the last century, Jews began to frequently name their children non-Jewish names, the Jews repatriated to Israel in the 70s, on the contrary, more and more often gave their children names of Jewish origin (biblical Hebrew, modern Hebrew, etc.). It can be said that most of the Jews of the older age group bear names of Jewish origin that were common in Georgia. The middle generation carries both Jewish and non-Jewish names, which were given to them in Georgia. In the youngest group, Jewish and modern Jewish names are common. For example, Noah, Rebecca, Daniel, Joshua, Gabby, Ari...

Many factors influence parents' decision to give their children distinctly Jewish names. Among them is the time spent in Israel. Among the first wave of repatriates, in particular, the parents of children born after the 70s, there is a desire to bear distinctive Jewish names.

It should be noted that it is a widespread tradition in Georgia to name the deceased. Jews who migrated from Georgia have a similar tradition. However, as Sarah Benor observes in her study of American Jews, "the Ashkenazi tradition of naming babies after a deceased (respected person) is strong among American Jews of various origins.

Whereas Sephardi/Mizrahi Jews name their babies more in honor of the living (a respected person)." Perhaps, these influences are greater in Israel. Among the Jews who migrated from Georgia of all origins, both cases are confirmed: naming a name in honor of a dead person as well as a living person.

At the same time, as we mentioned, the vast majority of Jewish respondents have a Jewish ritual name, which is basically different from their common name. However, since since the 1970s, Jews living in Israel have increasingly chosen identical ritual and official names, it is common for the middle and younger generations to have only one Jewish name.

Thus, the rituals of naming Jews in Georgia and Israel are almost the same. Almost all Jews in Georgia had a Jewish name, which was sometimes official, sometimes only ritual. The use of less Jewish connotations or non-Jewish names as official names has become especially widespread in Georgia since the 70s, as Jewish names often caused ridicule. Even after repatriation to Israel, the parallel existence of official and ritual names and the use of the same name for both purposes is confirmed. The main difference is that, in order to avoid ridicule, non-Jewish names common in Georgia are no longer called in Israel.

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Art History

К 120-летию композитора Лати́фа Ха́миди

ТВОРЧЕСТВО Л.А.ХАМИДИ В ТРУДАХ МУЗЫКОВЕДОВ АКАДЕМИИ НАУК РЕСПУБЛИКИ КАЗАХСТАН¹

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Аннотация. В статье представлено отражение личности и многогранной деятельности Лати́фа Ха́миди в трудах ученых-музыковедов Национальной академии наук Республики Казахстан. На основе анализа публикаций Ахмета Жубанова, Бориса Ерзаковича, Мариям Ахметовой, Бисенгали Гизатова, Жиенбека Рсалдина, Гафуры Бисеновой, Алмы Темирбековой, Зейнура Коспакова, Сары Кузембай и других выявлены основные направления изучения творческого наследия композитора. Особое внимание уделено тому, как в научной литературе раскрываются не только его авторские достижения, но и деятельность в качестве педагога, дирижера, хормейстера, этнографа, организатора и общественного деятеля. Показано, что большинство исследований сосредоточено на композиторском творчестве Лати́фа Ха́миди и, прежде всего, на его сотрудничестве с Ахметом Жубановым при создании оперы «Абай», тогда как другие направления его деятельности изучены менее полно. Установлено, что общей особенностью публикаций является акцент на высоких нравственных качествах Лати́фа Ха́миди – доброжелательности, скромности, отзывчивости, гуманизме и стремлении поддерживать молодых музыкантов. Сделан вывод о необходимости комплексного переосмысления наследия Лати́фа Ха́миди как выдающегося деятеля казахской национальной культуры, внесшего значительный вклад в развитие профессионального музыкального искусства и образования, фольклористики и культурного просвещения.

Ключевые слова: Лати́ф Ха́миди, музыкознание, история казахской музыки, Ахмет Жубанов, национальная культура Казахстана, творческое наследие, этномузыкология, музыкальная педагогика, опера «Абай», нравственные ценности.

Лати́ф Ха́миди (1906-1983) – выдающийся композитор, который заложил основы становление и развитие казахского профессионального музыкального искусства, народный артист Казахской ССР, лауреат Государственной премии Казахской ССР. Несмотря на широкую известность, прежде всего, как композитора, его творческая и общественная деятельность была значительно шире.

Лати́ф Ха́миди оставил заметный след в истории казахской музыки XX в. не только как композитор, но и как хормейстер, дирижер, педагог, этнограф и общественный деятель. Он

¹ Представлено по проекту «Цифровая трансформация экосистемы литературоведения, фольклористики и искусствоведения Казахстана: междисциплинарные исследования» (BR27101897).

внес существенный вклад не только в развитие национальной профессиональной музыки, но и в собирание, изучение, обработку и популяризацию казахского песенного и инструментального наследия. Его творчество является ярким примером органичного сочетания народных музыкальных традиций и профессионального композиторского искусства.

В этой связи закономерно возникает вопрос: каким образом Латифу Хамиди удалось столь плодотворно реализовать себя в столь разных сферах деятельности и почему сегодня его заслуги за пределами композиторского творчества остаются менее изученными и недостаточно представлены в научном и общественном сознании? Поиск ответа на эти вопросы обуславливает необходимость комплексного осмысления его наследия и выявления взаимосвязи между его творческой, научно-просветительской и общественной деятельностью.

На мой взгляд, в основе многогранной самореализации Латифа Хамиди лежали его высокие нравственные качества. Именно они позволили ему не ограничиваться исключительно композиторским творчеством, а активно участвовать в развитии различных направлений казахской музыкальной культуры. Он не только создавал собственные произведения, но при этом и искренне поддерживал творческий рост своих коллег, проявляя неподдельное внимание к их профессиональному становлению и успехам.

В этом контексте особенно созвучным личности Латифа Хамиди представляется высказывание немецкого философа Иммануила Канта: «Человечность – это способность участвовать в судьбе другого человека» [2]. Его жизненный путь и общественная деятельность убедительно свидетельствуют о воплощении этого нравственного принципа. Поэтому при оценке творческого наследия Латифа Хамиди важно учитывать не только его профессиональные достижения, но и его человеческие качества, во многом определившие масштаб и значение его деятельности.

Жизненный путь и многогранная деятельность Латифа Хамиди получили всестороннее освещение в исследованиях казахстанских ученых-музыковедов. В их трудах с научных позиций рассматриваются творческое наследие композитора, его педагогическая, дирижерская и хормейстерская деятельность, этнографические достижения, а также общественная работа. Эти источники позволяют объективно оценить роль Латифа Хамиди в развитии казахской музыкальной культуры.

Следует отметить сборник «Латиф Хамиди», опубликованный в 2006 году в серии «Выдающиеся люди» [1]. В книге всесторонне освещены жизнь и творчество композитора, а также его публицистическая и просветительская деятельность, что позволяет раскрыть многогранность его личности и определить ее значение в истории национальной культуры Казахстана.

Творческое наследие Латифа Хамиди не осталось вне поля зрения исследователей, работавших в области искусствоведения и музыковедения Национальной академии наук Республики Казахстан. Большинство ученых, представлявших отдел музыковедения Академии, посвятили его жизни и творчеству специальные исследования и научные статьи.



Ахмет Жубанов и музыковеды Академии наук
Казахстана



Латиф Хамиди с коллегами –
Б.Ерзаковичем, Г.Бисеновой и др.

На фотографиях представлены ученые, работавшие вместе с основателем отдела Ахметом Жубановым: Б.Ерзакович, М.Ахметова, Ж.Рсалдин, Б.Гизатов, З.Коспаков, Г.Бисенова, А.Темирбекова, С.Кузембай и другие исследователи. Каждый из них в разные годы поддерживал с Латифом Хамиди творческие и научные связи, что нашло отражение в их исследованиях и воспоминаниях.

Так, с Ахметом Жубановым Латифа Хамиди связывало плодотворное композиторское сотрудничество, а с представителями последующего поколения ученых он совместно разрабатывал методические труды, учебные пособия, песенные сборники и научные издания. Это свидетельствует о том, что Латиф Хамиди был не только композитором, но и активно участвовал в научно-методической деятельности.

Анализ публикаций ученых Академии показал, что значительная их часть была приурочена к юбилейным датам композитора. Это позволяет сделать вывод, что научное осмысление творческого наследия Латифа Хамиди чаще всего активизировалось именно в связи с его юбилеями, тогда как систематическое изучение его многогранной деятельности оставалось менее последовательным.

Авторы	Название статьи
Жубанов А.К.	Дос туралы лебіз
Ерзакович Б.Г.	Нестареющий талант (К 60-летию со дня рождения композитора Л.Хамиди); Живое наследие; Напевы седой старины; Счастье созидательной жизни
Ахметова М.М.	Қазақстан композиторларының әндері мен романстары
Гизатов Б.Г.	Үлкен дарын; Опера о поэте (Опера А.Жубанова и Л.Хамиди «Абай»...); Композитор әрі ұстаз; Хамидиі қазақтың... Латиф Хамиди
Рсалдин Ж.Ж.	Қазақ совет музыкасының қарт тарланы Талант иесі (Л.Хамидидің туғанына 80 жыл)
Бисенова Г.Н.	«Абай» операсы
Темирбекова А.З.	Халық жыры (Л.Хамиди мен А.Жұбановтың «Абай» операсы. Либреттосы М.Әуезовтікі)
Коспаков З.К.	Саз бен сөз сәулеткері
Күзембай С.А.	Солнечные мелодии (к 70-летию Л.Хамиди) Абай операсы, Төлеген Тоқтаров опералары

Сравнительный анализ публикаций показал, что практически все они имеют одну общую особенность: наряду с анализом творческого наследия Латифа Хамиди их авторы уделяют особое внимание его высоким нравственным качествам. Это свидетельствует о том, что в оценке его личности важное место занимали как профессиональные достижения, так и человеческие достоинства.

Ахмет Жубанов, характеризуя нравственный облик и педагогическое призвание Латифа Хамиди, писал: «К тому же Латиф всегда отличался доброжелательностью и искренним стремлением делать людям добро. Среди небольшой группы молодых музыкантов, только начинавших свой путь в искусстве, он старался разглядеть будущие творческие дарования. Он обучал талантливых музыкантов оркестра основам композиторского мастерства, помогал редактировать их первые сочинения, добивался их исполнения и практически все свое свободное время посвящал музыкально-просветительской работе» [1, 130].

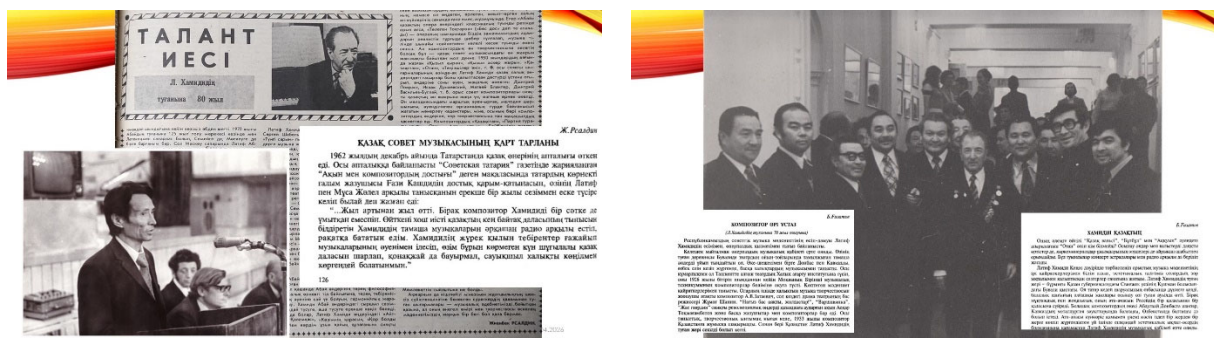
Из приведенного высказывания следует, что основу творческой деятельности Латифа Хамиди составляло наряду с высоким профессиональным мастерством и глубокое чувство гражданской ответственности, стремление поддерживать и развивать талант других. Он целенаправленно занимался поиском молодых дарований, содействовал раскрытию их творческого потенциала, делился своими знаниями и непосредственно помогал в становлении их первых произведений. Воспоминания академика Ахмета Жубанова убедительно свидетельствуют о том, что Латиф Хамиди был не только выдающимся композитором, но и наставником, искренне заботившимся о профессиональном становлении молодых музыкантов и развитии национальной музыкальной культуры.

Борис Ерзакович также придает особое значение человеческим качествам Латифа Хамиди. Он характеризует композитора следующими словами: «По натуре это был

простой, добрый, с открытой душой человек, который вызывал к себе симпатии и любовь многих людей» [1, 153].

Эта характеристика позволяет увидеть, что одной из основ творческих успехов Лати́фа Хамиди были его открытость, искренность и доброжелательное отношение к людям. По мнению Б.Ерзаковича, именно простота, общительность и душевная щедрость композитора способствовали тому, что он пользовался большим уважением в творческой среде. Эти качества помогали ему устанавливать прочные профессиональные и человеческие связи с коллегами, учениками и представителями музыкального сообщества.

Жиенбек Рсалдин в статье «Талант иеси», опубликованной к 80-летию Лати́фа Хамиди, также начинает повествование не с анализа его творчества, а с характеристики его личности. В этой связи он приводит воспоминания Ахмета Жубанова: «Даже если ты хорошо знаком с творчеством Латеке, это еще не значит, что знаешь его в повседневной жизни. Он был необыкновенно заботливым, честным и отзывчивым человеком. Всегда охотно откликался на любую просьбу, никому не отказывал. Умел по-детски искренне радоваться, а порой и обижался. А уж в чувстве юмора ему трудно было найти равных: он умел превратить самый обычный случай в веселую историю. Ведь чувство юмора – один из признаков настоящего ума» [1, 160].



Примечательно, что Жиенбек Рсалдин начинает свою юбилейную статью именно с этой характеристики. Это свидетельствует о том, что, раскрывая личность Лати́фа Хамиди, он ставит на первый план не его профессиональные достижения, а человеческие качества. Такой подход показывает, что современники воспринимали его, прежде всего, как доброжелательного, душевного и открытого человека, умевшего легко находить общий язык с окружающими.

Бисенгали Гизатов также придает особое значение нравственным качествам Лати́фа Хамиди, характеризуя его как «скромного, доброжелательного и общественно активного человека» [1, 142].

Эта лаконичная, но емкая характеристика свидетельствует о том, что авторитет Лати́фа Хамиди среди современников определялся не только его творческими достижениями, но и человеческими достоинствами. Отмеченные Б.Гизатовым скромность, доброжелательность и общественная активность созвучны оценкам Ахмета Жубанова, Бориса Ерзаковича и Жиенбека Рсалдина. Следовательно, повторяющиеся в исследованиях разных лет характеристики нельзя считать случайными – они отражают устойчивое представление о личности Лати́фа Хамиди, сложившееся в научной и творческой среде.

Сопоставление трудов ученых Академии позволяет выявить общую закономерность: обращаясь к личности Лати́фа Хамиди, авторы непременно подчеркивают его высокие нравственные качества – скромность, отзывчивость, доброжелательность, простоту в общении и активную общественную позицию. Именно эти качества рассматриваются как духовная основа его композиторской, педагогической и общественной деятельности.

Мариям Ахметова акцентирует внимание на вкладе Латифа Хамиди в становление казахской профессиональной музыки, в первую очередь, массовой песни и хорового искусства. По ее оценке, «Л.А.Хамиди сыграл значительную роль в создании казахской советской массовой песни и формировании ее нового стилевого направления». Исследователь также отмечает, что его произведение «Песня Красной Армии» («Қызыл әскер жыры») уже в 1930-е годы получило широкое распространение среди народа» [4, 46].

Наряду с анализом творческого наследия М.Ахметова особо подчеркивает организаторскую деятельность Латифа Хамиди. Среди специалистов, внесших значительный вклад в становление хорового искусства республики, она называет Д.Ковалева, И.Коцыка, Д.Мацуцина и Латифа Хамиди, высоко оценивая его многолетнюю работу в этой сфере. Такая оценка позволяет рассматривать Латифа Хамиди не только как композитора, но и как одного из деятелей, сыгравших важную роль в развитии хоровой культуры, становлении новых жанров и музыкального образования Казахстана.

Анализ трудов ученых Академии показывает, что большинство авторов интерпретирует творчество Латифа Хамиди в контексте его сотрудничества с Ахметом Жубановым. Особенно это характерно для исследований, посвященных истории создания классического произведения казахского оперного искусства – оперы «Абай», где творческий вклад Латифа Хамиди неизменно получает высокую оценку.

Так, Зейнур Коспаков и Тмат Мергалиев в своих работах, посвященных творчеству Ахмета Жубанова, освещают историю создания оперы «Абай», подчеркивая, что это произведение было создано в тесном творческом содружестве с Латифом Хамиди. Тем самым имя Латифа Хамиди вводится в научный оборот, прежде всего, через призму его совместной деятельности с Ахметом Жубановым, а их вклад в развитие казахского оперного искусства оценивается как единое творческое достижение [5].



А.Темирбекова, С.Кузембай, Б.Ерзакович,
М.Ахметова (1 ряд)

А.Петров, Г.Бисенова, А.Кетегенова (2 ряд)



Л.Хамиди и З.Коспаков

В исследованиях Гафуры Бисеновой творчество Латифа Хамиди также преимущественно анализируется в связи с его сотрудничеством с Ахметом Жубановым. В статьях, посвященных опере «Абай», имена обоих композиторов неизменно упоминаются вместе, а особое внимание уделяется истории создания произведения и их творческому партнерству [6].

Вместе с тем Гафура Нургалиевна не ограничивает деятельность Латифа Хамиди исключительно участием в создании оперы «Абай». В своих работах она обращается и к его этнографической деятельности, отмечая, что композитор записывал песни Абая от его родственников. Кроме того, в исследованиях, посвященных оркестровому искусству, высоко оценивается его деятельность как дирижера и автора обработок народных песен и кюев.

Таким образом, исследования Гафуры Бисеновой раскрывают Латифа Хамиди не только как композитора, но и как этнографа, автора обработок фольклорных образцов и

дирижера. Это свидетельствует о постепенном расширении научных представлений о многогранности его вклада в развитие казахской музыкальной культуры.

Статья Алмы Темирбековой «Халық жыры» также посвящена результату творческого сотрудничества Ахмета Жубанова и Латифа Хамиди – опере «Абай» [8]. Анализируя художественные особенности произведения, автор высоко оценивает совместный вклад двух композиторов в становление и развитие национального оперного искусства.



Выступление Л.Хамиди в связи с 70-летием
А.К.Жубанова



Президиум собрания к 70-летию
академика А.К.Жубанова

Аналогичным образом научные публикации Сары Адильгереевны Кузембай преимущественно посвящены исследованию оперы «Абай» [8]. В них рассматриваются музыкально-драматургическая структура произведения и его историческое значение для казахского оперного искусства, а вклад Латифа Хамиди оценивается в контексте его творческого сотрудничества с Ахметом Жубановым.

Подводя итог, следует отметить, что предпринятый анализ трудов ученых Академии позволяет воспринимать Латифа Хамиди не только как выдающегося композитора, но и как одного из ключевых деятелей, внесших многогранный вклад в становление и развитие казахской музыкальной культуры. Наряду с композиторским наследием в исследованиях нашли отражение его педагогическая, дирижерская, этнографическая, организаторская и просветительская деятельность. Однако степень изученности этих направлений остается неодинаковой. Если большинство публикаций сосредоточено на его сотрудничестве с Ахметом Жубановым, особенно в связи с созданием оперы «Абай», то самостоятельная научно-педагогическая, исполнительская и общественная деятельность Латифа Хамиди по-прежнему нуждается в более глубоком и комплексном исследовании.

Публикации ученых Академии свидетельствуют о том, что наследие Латифа Хамиди изучалось по нескольким основным направлениям. Одним из первых к личности и творчеству композитора обратился Ахмет Жубанов, опубликовав мемуарного плана статью «Дос туралы лебіз» («Слово о друге»), в которой дана высокая оценка его человеческим качествам и творческой деятельности. Эта работа стала одним из важнейших источников, определивших направление последующих исследований.

Особое место среди исследователей творчества Латифа Хамиди занимает Борис Ерзакович. В статьях «Нестареющий талант», «Живое наследие», «Напевы седой старины» и «Счастье созидательной жизни» он всесторонне раскрыл творческую эволюцию композитора, особенности его стиля, основанного на народной музыкальной традиции, а также его вклад в развитие национальной музыкальной культуры [1].

Вокальное творчество и педагогическое наследие Латифа Хамиди получили освещение в работах Мариям Ахметовой, тогда как его достижения в области оперного

искусства стали предметом исследований Бисенгали Гизатова, Гафуры Бисеновой и Алмы Темирбековой.

Статьи Жиенбека Рсалдина, Зейнура Коспакова и Сары Кузембай, опубликованные к юбилейным датам композитора, также внесли значимый вклад в популяризацию его творческого наследия. В этих публикациях с разных сторон рассматриваются его композиторская, педагогическая и культурно-просветительская деятельность.

Вместе с тем практически все проанализированные работы объединяет одна характерная особенность. Их авторы уделяют первостепенное внимание как профессиональным достижениям Лати́фа Хамиди, так и его нравственным качествам – скромности, доброжелательности, отзывчивости, заботливому отношению к людям и общительности. Именно таким образом оценки современников подтверждают, что основой его творческих успехов были высокие моральные принципы и гуманистические ценности.

Эту мысль созвучно выражает высказывание Симона де Бовуар: «Жизнь человека имеет смысл до тех пор, пока он вносит смысл в жизни других людей с помощью любви, дружбы, сострадания и протеста против несправедливости» [9]. Эта мысль в полной мере соотносится с жизненным путем и творческой деятельностью Лати́фа Хамиди. Он оставил глубокий след в истории казахской композиторской школы и своим музыкальным наследием, и искренней поддержкой окружающих, самоотверженным служением национальному искусству и значительным вкладом в развитие музыкальной культуры Казахстана.

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ЛАТИФ ХАМИДИ: “МОЛОДОСТЬ ВЕЧНЫХ МЕЛОДИИ”²

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Аннотация: Статья посвящена малоизученным аспектам творческого наследия Лати́фа Ха́миди (1906-1983), актуализируемым на основе архивных фотографий, незаслуженно забытых публикаций и других документальных источников. В центре внимания – литературно-публицистическая деятельность композитора, профессиональные связи с ведущими деятелями казахстанской музыкальной культуры, влияние на формирование национального оперного искусства. Анализируются авторские публикации Лати́фа Ха́миди, позволяющие выявить его эстетические взгляды и понимание предназначения художника (в их ряду – посвященные Евгению Брусиловскому, Назибу Жиганову, Бибигуль Тулегеновой). Особое внимание уделено фотографиям и конкретным произведениям как историко-культурным источникам, отражающим профессиональное окружение композитора, его творческое сотрудничество с Ахметом Жубановым, Борисом Ерзаковичем, Бахытжаном Байкадамовым, Куддусом Кужамьяровым и другими представителями казахстанской композиторской школы. Музыкальная драма «Жамбыл и Айкумис» Л.А.Хамиди охарактеризована в контексте развития национального театра и художественного осмысления традиций айтыса. Сделан вывод, что комплексное изучение архивных документов (включая визуальные) позволяет существенно расширить представления о Лати́фе Ха́миди не только как о композиторе, но и как о публицисте, критике, исследователе, педагоге, организаторе культурной жизни, чья деятельность в своей многогранности и результативности оказалась исключительно значимой для становления профессионального музыкального искусства Казахстана.

Ключевые слова: Лати́ф Ха́миди, архивные источники, музыкально-критическое наследие, история казахской музыки, опера, музыкальная драма, айтыс, композиторская школа, культура Казахстана.

«Молодость вечных мелодий» [1] – название публикации Лати́фа Ха́миди (1965), посвященной юбилею Евгения Брусиловского (1905-1981). Примечательна характеристика, которую Лати́ф Ха́миди дает своему коллеге: «В русском языке есть удивительно емкое по смыслу слово – искатели. За ним встают люди беспокойной судьбы, неумной творческой воли, открыватели новых начал, новых неисследованных областей в самых разнообразных сферах жизни. Иным невозможно себе представить Евгения Григорьевича Брусиловского» [1]. В этих словах раскрывается и образ Е.Г.Брусиловского, и система ценностей самого Лати́фа Ха́миди, для которого постоянный поиск, внутренняя неуспокоенность и стремление к художественным открытиям являлись важнейшими качествами личности художника.

² Работа выполнена в рамках реализации проекта Комитета науки Министерства науки и высшего образования Республики Казахстан BR27101897 «Цифровая трансформация экосистемы литературоведения, фольклористики и искусствоведения Казахстана: междисциплинарные исследования».

Выразительны и композиционные приемы, использованные автором. Статья обрамлена эмоциональными восклицаниями, образующими своеобразную смысловую «арку»: «60 лет – жизнь. И какая жизнь!» – в начале повествования и «А впереди еще много открытий. 60 лет... Разве это предел!» – в его завершении. Благодаря этому юбилей воспринимается не как итог, а как очередной этап творческого пути, открывающий новые перспективы.

Заключительный тезис публикации также заслуживает особого внимания. Лати́ф Хамиди поздравляет юбиляра не просто с памятной датой, а с «МОЛОДОСТЬЮ ТВОРЧЕСКОЙ ДУШИ», тем самым подчеркивая, что истинный возраст художника определяется не прожитыми годами, а неиссякаемой способностью к духовному обновлению.

Показательно, что эти слова сегодня воспринимаются как своеобразная автохарактеристика самого Лати́фа Хамиди. Его понимание природы художественного творчества, нашедшее преломление в статье о Брусиловском, во многом отражает собственный жизненный и творческий путь композитора, поскольку открытость новому и душевная молодость оставались неизменными принципами на протяжении всей жизни.



В Союзе композиторов Казахстана

Представляют интерес фотографии, запечатлевшие Лати́фа Хамиди на заседаниях Союза композиторов Казахстана. На одном из таких снимков рядом с ним (слева) находятся композиторы – Капан Мусин и Нагим Мендыгалиев, чьи 105-летние юбилеи приходятся на 2026 год, а также представители следующего поколения – Сыдык Мухамеджанов и Еркегали Рахмадиев (во 2-м ряду). Эта фотография ценна не только как документ, но и как свидетельство творческой атмосферы, объединявшей несколько поколений казахстанских музыкантов. Выразительно лицо самого Лати́фа Хамиди во время выступления, не менее показателен и внимательный взгляд Бориса Ерзаковича (второй справа), обращенный к своему другу и коллеге. В подобных деталях особенно отчетливо проявляются уважение, профессиональная солидарность и духовная близость, характерные для музыкального сообщества того времени.

Не случайны и названия работ Бориса Ерзаковича, посвященных Лати́фу Хамиди и отражающих сущность его уникальной личности: «Живое наследие», «Счастье созидательной жизни», «Нестареющий талант». Каждое из этих определений акцентирует не только масштаб личности композитора, но и непрерывность его творческого развития, сохранявшегося на протяжении всей жизни.

Публицистическое наследие Лати́фа Хамиди дает возможность глубже понять и его собственное отношение к искусству. В статье «Мой путь в музыку» (1973) он лаконично формулирует главное дело своей жизни: «Делом всей моей жизни стали оперы» [2]. Вместе

с тем опера занимала особое место не только в его композиторском творчестве, но и в деятельности Латифа Хамиди как публициста и критика. На протяжении многих десятилетий он внимательно следил за развитием национального оперного искусства, откликаясь на наиболее значительные премьеры обстоятельными аналитическими статьями.

Характерным примером является опубликованная в 1949 году рецензия на премьеру оперы «Алтынчеч» [3] Назиба Жиганова, с которым Латифа Хамиди связывало многолетнее профессиональное общение, начавшееся еще в 1930-е годы в Оперной студии при Московской консерватории. В последующие годы в поле его исследовательского внимания оказались крупнейшие произведения казахстанского искусства: «Ахан серэ – Актоты» Сыдыка Мухамеджанова (1982), «Садыр палуан» Куддуса Кужамьярова (1977), «Алпамыс» Еркегали Рахмадиева (1974) и другие сочинения. Эти публикации свидетельствуют о глубоком знании Латифом Хамиди закономерностей музыкально-театральной практики и его постоянном стремлении осмыслить процессы становления и развития оперного жанра в Казахстане.



Для реконструкции творческой биографии Латифа Хамиди ценными источниками являются изобразительные и фотодокументальные материалы. В первую очередь назовем картину Леонида Леонтьева (также юбиляра 2026-го года), на которой композитор изображен стоящим у рояля в окружении крупнейших представителей казахской музыкальной культуры. Композиция полотна символична: между Евгением Брусиловским и Ахметом Жубановым находится Кенен Азербаетов, напротив расположилась Дина Нурпеисова, рядом с ней – Борис Ерзакович, Куддус Кужамьяров и Капан Мусин. Такое художественное решение отражает не только круг общения Латифа Хамиди, но и преемственность различных поколений и направлений (традиционного и современного), объединенных идеей достижения новых высот.

Не менее показательна и более ранняя коллективная фотография, запечатлевшая Латифа Хамиди вместе с Кененом Азербаетовым, Ахметом Жубановым, Евгением Брусиловским, Василием Великановым, Бахытжаном Байкадамовым, Куддусом Кужамьяровым, Капаном Мусиным, а также Манарбеком Ержановым (слева 4-й во 2-м ряду), 125-летие со дня рождения которого также отмечается в 2026 году. На этом снимке запечатлен конкретный период из истории: каждая фигура представляет самостоятельную творческую величину, а их совместное присутствие подчеркивает ту профессиональную и человеческую среду, в которой формировался и работал Латиф Хамиди.

Подобные визуальные документы имеют не только иллюстративную, но и историко-культурную ценность. Они позволяют «увидеть» Латифа Хамиди не как изолированную фигуру, а как одного из центральных участников сообщества состоявшихся музыкантов, композиторов, исполнителей и исследователей, совместными усилиями заложивших основы академического искусства Казахстана. В этом контексте и живописное полотно, и коллективные фотографии становятся важными и достоверными «страницами» в

своеобразной «летописи» эпохи, сохранившей не только лица, но и атмосферу творческого единения, взаимного уважения и общего служения национальной культуре.

Еще одним значимым документальным свидетельством является фотография, сделанная в Камерном зале Алматинской государственной консерватории им. Курмангазы. На ней Латиф Хамиди запечатлен в кругу своих коллег – композиторов и музыковедов, что подчеркивает его активное участие в профессиональной, педагогической и научной жизни:



Рядом с ним – композиторы И.Иванов-Сокольский и Б.Джуманиязов (и его юбилей приходится на 2026 год), а также исследователи, внесшие существенный вклад и в изучение творческого наследия Латифа Хамиди: Мариям Мукатаевна Ахметова, Жиенбек Жуманбаевич Рсалдин, Гафура Нургалиевна Бисенова, Лидия Ивановна Гончарова, Сара Адильгиреевна Кузембай и Алтын Салимовна Кетегенова. Особо значимо то обстоятельство, что многие из упомянутых коллег Л.Хамиди не только были современниками композитора, но и посвятили на разных этапах свой труд изучению тех или иных аспектов его творчества. В центре их внимания находились как общие вопросы творческой биографии Латифа Хамиди, так и его оперное наследие, ставшее предметом специальных изысканий. Тем самым фотография приобретает дополнительную историко-культурную ценность, фиксируя своеобразную преемственность: рядом с композитором находятся те, кто впоследствии будет в рядах исследователей его жизни и творчества.

Подобные материалы позволяют воспринимать Латифа Хамиди как яркого композитора своего времени и как фигуру, чье творческое наследие уже при жизни стало объектом научного осмысления. Архивные фотографии такого профиля оказываются важными историческими источниками, отражающими формирование практики освоения современных реалий.

В этом блоке – и аудиозаписи разных лет:

Российский национальный музей музыки Коллекции онлайн ЭКСПОНАТЫ ЛЮДИ ВЫСТАВКИ АЛЬБОМЫ НОВОСТИ

← Вернуться в список Экспонаты

Просмотрено 5 из 39

К.Ажимуратов (Кыл Кобыз).Скворец (нар. песня, обр. Б. Ерзаковича). Романс (Л. Хамиди). Жез киик (А. Жубанов). Шынырау, Казан (Ыхлас). Коныр (Коркыт). /Исп. Сауле Сагынбаева - ф-но (1- 3). 1981 г.

Наименование, название	К.Ажимуратов (Кыл Кобыз).Скворец (нар. песня, обр. Б. Ерзаковича). Романс (Л. Хамиди). Жез киик (А. Жубанов). Шынырау, Казан (Ыхлас). Коныр (Коркыт). / Исп. Сауле Сагынбаева - ф-но (1- 3)
Датировка	1981 г.
Материал, техника	винил
Размер	Миньон
Изготовитель	"Мелодия". Московский завод грампластинок
Коллекция	Грампластинки
Музейный номер	ГЦММК КП-10414/97. ГРП-46130



Особенно символично, что на представленной пластинке в фортепианных версиях «пересекаются» произведения из репертуара кыл-кобыза и домбры как отражение происходившего в казахской музыкальной культуре 1930-1950-х годов: традиционные инструменты становились основой профессионального исполнительства и композиторского творчества, а А.Жубанов, Л.Хамиди и Б.Ерзакович были непосредственными участниками этого процесса. Их объединяла работа с фольклорным материалом, его запись, обработка и сценическое воплощение. Именно такие, на первый взгляд, небольшие «находки» помогают уловить реальные контексты эпохи. Приведем еще одно сопоставление – с привлечением нотного материала:



Латиф Хамиди сфотографирован в момент «встречи» и обсуждения изданного фортепианного сборника 1968 года, составленного Н.Мендыгалиевым. В сборник включены произведения разных авторов, в том числе фортепианная версия пьесы Л.Хамиди «Косалка» (№10) и «Три прелюдии» Г.А.Жубановой (№11). Примечательно, что в производство он был подписан 25 декабря 1967 года, то есть еще при жизни Ахмета Жубанова [4]. Это издание и фото могут быть проинтерпретированы как еще одно из свидетельств преемственности и творческого взаимодействия представителей композиторской школы разных поколений.

Музыкальной драме Латифа Хамиди «Жамбыл и Айкумис» в 2026 году исполняется 80 лет. Произведение было создано к 100-летию юбилею Жамбыла Жабаева, однако в научный оборот введено значительно позднее – в 1996 году, в период празднования 150-летия акына [5]. На первой из ниже размещенных иллюстраций – композитор Латиф Хамиди и автор либретто Калижан Бекхожин, на другой – первая страница либретто с перечнем действующих лиц. Примечательно, что действие произведения относится к тому периоду, когда Жамбылу было около 30 лет, то есть задолго до его всенародной славы.

Своеобразие музыкальной драмы, проявленное на различных уровнях ее художественной структуры, во многом определяется особенностями драматургического




ЖАМБУЛ МЕН АЛУҢҮҢ
(Бір актиал музыкалды драма)

Кинорежиссёр

Ж а м б у л — акын, 30 жашарда
А л у ң ү н — акын кыз, 19 ж.
С а л м а — бар жигит. Актерлердин авторлорун кувёт
Ж а м б у л — күйрүткөн, акын, 30 ж.
А л у ң ү н — күйрүткөн, акын, 30 ж.
 Бир чеч кылдар. Жамбулдин сергектери, шабарман

А.Акуев бектери. Ойроткөн кайың. Келген аламындал, кай уукут тоюна жамалган коокошторлор, жигиттерди ой шырардын жолдору. Аркында Алунун мен денемиз.

Он шырардама.

Ажарач ун тукунун ажарындам.
 Салма, кудай, жамалган пазарымда-ай,
 Кыз кеткен соң алууланын кымык кетер-ай,
 Жеринекенин гаргасын башарымда-ай.

Келди кайда-а, өң бүркт, мөңдү кайда,
 Дама койгон эле үйүңе уулар сайда-ай.
 Мекениңди, өң калкы, айтып кетти-ай.
 Жат болукту аламын, оспаймада-ай.

Эсем мүйүз, Күркүшм, мына мен саяга айткылар сендиң, агуулмалды
 ой-жерлерге жазыпкөнчө өңд, жеткенди бе шылыңкылар?
 А.Вукмис. Жеткендай-ай, бар сырым өңмө мөңмө гөй, өрмөмөн өргө.




Подчеркнем, что айтыс Жамбыла и Айкумис охватывает около трети всех номеров пьесы. При этом их последовательность обусловлена логикой развития поэтического диалога и направлена на воссоздание атмосферы состязания, в которой разворачивается действие. Образ Жамбыла впервые раскрывается в динамике творческого становления. Герой предстает в стремительном движении мысли, с присущими молодости горячностью, импульсивностью, природной напористостью и неудержимым стремлением к творческому самоутверждению. Оригинальность авторского замысла определяется не пафосом борьбы и не экспрессией чувств, а утверждением этики творческой личности – активной, целеустремленной, осознающей свое предназначение. Способ существования героя раскрывается через постоянное преодоление границ, освоение нового художественного пространства и столкновение различных творческих позиций, что придает произведению концептуальную глубину.

Представляя архивные фотографии, характеризующие творческое окружение Латифа Хамиди, отметим групповой снимок, впервые введенный в научный оборот в 2024 году в рамках мероприятий, посвященных 100-летию со дня рождения Сыдыка Мухамеджанова. На фотоснимке (1971) запечатлены самые яркие представители казахстанской композиторской школы в обстановке, непосредственно отражающей их профессиональное и личностное общение:



Справа – два снимка, сделанные в Усть-Каменогорске в 1963 году и важные не только как дополняющие сведения о биографии композитора: они документируют его многолетние творческие связи с Ахметом Жубановым, ведущими деятелями культуры и общественностью разных регионов Казахстана.

Очень ценной представляется групповая фотография 1962 года, на которой запечатлен практически полный состав Союза композиторов Казахстана того периода. Среди участников на снимке – Кенен Азербаетов, во 2-м ряду Бахытжан Байкадамов, Газиза Жубанова, Мариям Ахметова, П.В.Аравин, Л.А.Хамиди, Б.Г.Ерзакович, Нагим Мендыгалиев, Бисенгали Гизатова (добавим, что ему, как и Жиенбеку Рсалдину, в 2025 году исполнилось 100 лет со дня рождения), Капан Мусин, Дм.Мацуцин, а также другие видные деятели национальной музыкальной культуры, что придает данному архивному фото (из фондов ЦГА РК) дополнительное историко-культурное значение.



Как известно, события 1951 года в истории казахстанской культуры – тема, не получившая полного и окончательного освещения. Этот период оказался сложным и неоднозначным для многих представителей национальной интеллигенции, в том числе для Ахмета Жубанова, его ближайшего окружения и Латифа Хамиди – соавтора двух опер. Во многом происходившее в начале 1950-х годов стало продолжением тех процессов, с которыми им уже приходилось сталкиваться ранее. Новая волна идеологического давления оказала существенное влияние на творческую деятельность композиторов, характер общения и дальнейшее развитие музыкального искусства.

Архивные материалы позволяют увидеть события 1951 года не только через призму официальных документов, но и как часть повседневной творческой жизни композиторов,

сохранившейся в фотографиях, публикациях и других документальных свидетельствах. Так, дополнительный свет на обстоятельства этого периода проливают воспоминания самого Латифа Хамиди, сохранившиеся в рукописи начала 1970-х годов. Описывая начало своей работы в Казахской государственной филармонии, композитор, как бы мимоходом, фиксирует характерную для того времени ситуацию: «Во время следующих репетиций приходил и Ахмет Куанович... Однако директор филармонии Саркисов категорически запретил мне встречаться с Ахметом Куановичем, и администраторам было приказано не разрешать ему заходить в здание филармонии. После этого Ахмет Жубанов предложил мне встречаться у него на квартире» [5].

Это свидетельство представляет ценность как источник личного происхождения. Оно позволяет «увидеть», каким образом общественно-политические обстоятельства начала 1950-х годов непосредственно отражались на профессиональном взаимодействии музыкантов. Вместе с тем воспоминания Латифа Хамиди свидетельствуют о том, что сложившиеся творческие и человеческие отношения между ним и Ахметом Жубановым сохранялись, несмотря на административные ограничения и неблагоприятную культурно-политическую ситуацию.

Литературно-публицистические работы Л.Хамиди [6] составляют отдельную страницу его творческого наследия.

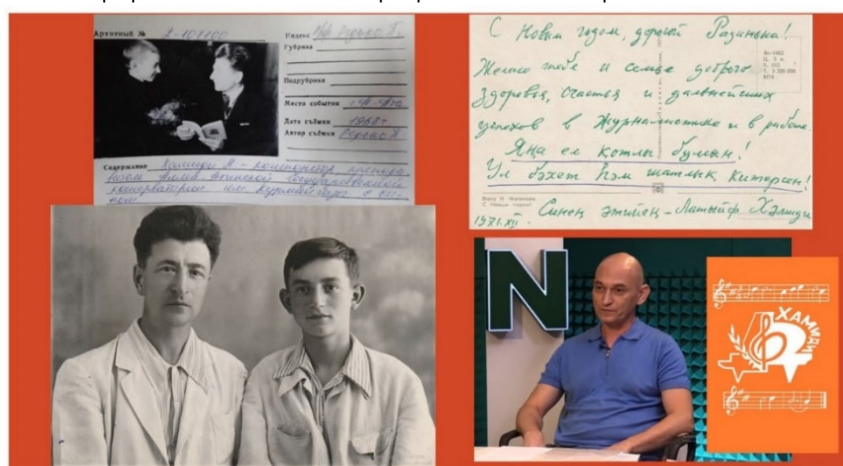
Публикация 1951 года с участием Латифа Хамиди и Газиза Дугашева представляет интерес не только как подтверждение документальной достоверности фотографии, сегодня уже легкодоступной, но и как важное слагаемое культурно-исторического контекста.



Сотрудничество с Бибигуль Тулегеновой – этому сюжету посвящен целый ряд публикаций композитора на русском и казахском языках, в которых нашли отражение его высокая оценка исполнительского мастерства певицы, размышления о природе вокального искусства и интерпретации национального репертуара. Богатство и содержательная многогранность этих материалов позволяют рассматривать их как самостоятельное направление в изучении творческой биографии и наследия Латифа Хамиди, заслуживающее специального исследования.



Особенное место принадлежит материалам, связанным с семьей композитора: приведу в пример фотографию Латифа Хамиди с сыном и адресованную ему почтовую открытку. Эти документы, размещенные в открытом доступе внуком композитора, дополняют творческий портрет важными биографическими штрихами.



Напомню и о книге отца и сына – Л.А.Хамиди и Р.Л.Хамиди – 1975 года, посвященной Ришату и Муслиму Абдулиным [8]. Издание раскрывает творческий путь выдающихся братьев-певцов, их оперный и камерно-дуэтный репертуар, который рассматривается в широком контексте становления и развития казахской профессиональной вокальной культуры. Примечательна система эпиграфов, основанная преимущественно на поэтических строках Жамбыла. За исключением фрагментов, связанных с операми «Даиси», «Демон» и «Евгений Онегин», они образуют смысловую рамку повествования. Заключительный эпиграф – «Я с песней путь в сердца найду» – приобретает символическое звучание и воспринимается как художественное обобщение, созвучное творческому кредо самого Латифа Хамиди.

Представляемые в завершение архивные фотографии позволяют реконструировать круг профессионального и официального общения Латифа Хамиди. Рядом с композитором запечатлены Габит Мусрепов, Серке Кожамкулов, во втором ряду – Мариям Ахметова и Борис Ерзакович. На большой групповой фотографии внимание привлекает композиционная «линия», соединяющая выступающего Жексембека Еркимбекова и Азербайджана Мамбетова, сидящего со скрещенными руками (1-й справа). Эти документальные материалы наглядно отражают творческую среду, в которой развивалось казахстанское музыкальное и театральное искусство второй половины XX века.



Еще один показательный и благодарный «сюжет» в биографии Латифа Хамиди – его многолетняя дружба с Борисом Ерзаковичем. В статье, опубликованной в 1978 году к 70-летию музыковеда, Латиф Хамиди вспоминал, что к тому времени их знакомство насчитывало «ровно 45 лет». Он писал: «Мы почти ровесники, может быть, поэтому мне кажется, что он все такой же молодой, жизнерадостный, энергичный и, как всегда, полон новыми творческими планами», а завершал публикацию пожеланием «и в дальнейшем быть таким же жизнерадостным, трудолюбивым и душевно молодым» [6]. Сегодня эти строки воспринимаются и как характеристика Бориса Ерзаковича, и как отражение человеческих качеств самого Латифа Хамиди.

Характер их взаимоотношений получает дальнейшее осмысление в публикации Бориса Ерзаковича, посвященной 90-летию Латифа Хамиди (1996). В ней автор вновь обращается к истории музыкально-медицинского общества (ММС), известного в кругу его участников как «семейное музыкально-медицинское общество». На протяжении почти двух десятилетий это объединение татарской интеллигенции, которое возглавлял Латиф Хамиди, служило пространством творческого общения, взаимной поддержки и сохранения культурных традиций. Здесь принимали гостей из Татарстана, в том числе Назиба Жиганова, Баки Урманче и других видных представителей культуры. Ерзакович писал: «Душой общества был Хамиди, остроумный, веселый рассказчик забавных историй и анекдотов, прекрасный исполнитель песен...» [9]. Эти воспоминания позволяют увидеть Латифа Хамиди вне официальных биографий – как человека, объединявшего вокруг себя друзей и единомышленников.

В той же статье Борис Ерзакович с глубокой скорбью отмечал, что Латиф Хамиди ушел из жизни менее чем через год после смерти своей супруги – ветерана войны и труда, врача Шарипжамал Харасовны Бигеевой. Примечательно, что и супруга самого Бориса Ерзаковича, также известный врач, скончалась примерно за год до него. Эти совпадения придают воспоминаниям личностную глубину, подчеркивая общность жизненного пути двух семей.

Символично и то, что свою статью, посвященную памяти Ахмета Жубанова, Латиф Хамиди озаглавил «Мәңгі бірге» («Навеки вместе»). Эти слова можно рассматривать как своеобразный нравственный итог связывавших их отношений, основанных на взаимном уважении, человеческой преданности и многолетнем творческом сотрудничестве.

Архивные документы, фотографии, рукописи и публикации позволяют «увидеть» Латифа Хамиди как композитора и как человека высокой внутренней культуры, открытого к общению, неизменно готового поддержать коллег и разделить с ними радость творчества. Именно «человеческое измерение» его личности – способность объединять людей, сохранять дружбу на протяжении десятилетий, сочетать творческую активность с душевной щедростью – является неотъемлемой частью его наследия. Поэтому в исторической памяти Латиф Хамиди остается не только одним из основоположников профессионального музыкального искусства Казахстана, но и человеком, сумевшим сохранить на протяжении всей жизни молодость творческой души.

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ПЕСНЯ Л.ХАМИДИ «БУЛБУЛ» В ИСПОЛНЕНИИ ЗВЕЗД ЭСТРАДЫ¹

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Аннотация. В статье исследуется, как менялся романс Латифа Хамиди «Булбул» с момента его создания до наших дней. Особое внимание уделено исполнению Куляш Байсеитовой и Бибигуль Тулегеновой, а также современным интерпретациям произведения казахстанскими эстрадными певицами. Проведенный анализ показывает, что романс не утратил своей популярности, продолжает звучать в новых исполнительских версиях и остается важной частью казахстанской музыкальной культуры.

Ключевые слова: эстрадная музыка, «Булбул», романс, интерпретация, вокал.

Развитие профессиональной музыки в Казахстане в XX веке связано с объединением разных музыкальных традиций – народных и европейских. И одним из известных композиторов этого времени был композитор и дирижер Латиф Хамиди. В 1945 году на стихи Н.Баймухамедова им был написан романс «Булбул» («Соловей»). Уже много лет он остается одним из лучших образцов казахстанской вокальной музыки.

За прошедшие десятилетия произведение не только сохранило свою популярность, но и получило новое звучание благодаря разным исполнителям и современным интерпретациям. Как отмечает Махфуза Казакбаева в своей статье: «Жемчужина современного казахского романса – “Соловей” Латифа Хамиди (1906-1983) на слова Н.Баймухамедова» [1, 101].

Первоначально романс «Булбул» был написан для исполнения колоратурным сопрано. Однако сегодня это произведение можно услышать не только на сценах концертных залов, но и на эстраде в исполнении современных певиц, сочетающих академическое и эстрадное пение. Это показывает, что музыка Латифа Хамиди остается актуальной и хорошо звучит в разных стилях. Вместе с тем, чтобы понять особенности современных трактовок, необходимо обратиться к первым интерпретациям, которые стали основой исполнительской традиции этого романса.

Общеизвестно, что первой исполнительницей «Булбул» была Куляш Байсеитова². Ее вклад в создание и популяризацию произведения отмечают многие авторы. Так, Фатима Оразбекова пишет: «Особенно популярными были песни “Булбул” и “Казахский вальс” композитора Латифа Хамиди. Эта песня была необычайно популярной в исполнении двух “казахских соловьев” – Куляш Байсеитовой и позже Бибигуль Тулегеновой. Известные в Союзе певицы лирического сопрано, приезжая с гастрольями в Казахстан, нередко включали ее в свой репертуар в знак уважения к казахскому народу и его искусству. А в создании мелодии песни самую активную роль сыграла Куляш Байсеитова. Латиф Хамиди много советовался с ней как с оперной звездой и будущей исполнительницей песни, написанной в жанре романсовой лирики» [2].

¹ Работа выполнена в рамках реализации проекта Комитета науки Министерства науки и высшего образования Республики Казахстан BR31715839 «Фундаментальные исследования в области литературоведения и искусствоведения: академическая преемственность и новые парадигмы».

² <https://youtu.be/0orZWSLIQ4s?si=FjHtqLgxl0FW8LO> – Куляш Байсеитова «Булбул».



Куляш Байсеитова (1945)



Бибигуль Тулегенова (1976)³

Со временем песню-романс «Булбул» стали исполнять не только академические, но и эстрадные певцы. Сегодня произведение продолжает звучать на различных концертных площадках, сохраняя свою популярность.

Так, на концерте, посвященном 95-летию Бибигуль Тулегеновой, романс «Булбул» исполнила Толкын Забирова. Как отмечается в статье: «Знаменитый романс “Бұлбұл” Латифа Хамиди, после которого Бибигуль Ахметовне как “Казахскому соловью” рукоплескали не только на родине, но и во многих странах мира, на этот раз прозвучал в исполнении заслуженного деятеля республики Толкын Забировой» [3]. Романс прозвучал на юбилейном концерте Бибигуль Тулегеновой в сопровождении Эстрадно-симфонического оркестра акима города Алматы под руководством Народного артиста Республики Казахстан Александра Викторовича Белякова⁴. При этом использование микрофона обеспечило романсу более мягкое и свободное звучание, чем это принято в оперной традиции. Т.Забирова сохранила чистоту звучания, особенно в высоком регистре и при появлении колоратурных фрагментов. В результате было достигнуто новое соотношение стилей, присущего академической вокальной музыки и собственной эстрадной: «мягкая» подача позволило прозвучать по-новому.

Одной из современных исполнительниц романса «Булбул» является Зарина Алтынбаева⁵. Она представляет произведение в современной интерпретации, сохраняя его академическую основу и дополняя ее элементами сценического искусства. На концерте, посвященном 30-летию организации ТЮРКСОЙ, который прошел в Центре всемирного наследия ЮНЕСКО в Париже, певица исполнила романс, представив его в новом сценическом формате [4]. Особое внимание Зарина Алтынбаева уделяет не только вокалу, но и сценическому образу. Для выступления был создан костюм в национальном стиле, а движения, световое оформление и сценическая постановка сделали исполнение более выразительным.

Сегодня романс «Булбул» по праву считается одним из знаковых произведений казахстанского вокального искусства и своеобразной визитной карточкой многих отечественных вокалисток. Его продолжают исполнять представители молодого поколения певиц, среди которых Салтанат Ахметова, Айзада Капонова, Мадина Абильдина, Аделина Мұхаметжанова, Аружан Алпысбаева и многие другие. Эти исполнительницы представляют новое поколение казахстанской вокальной школы, выступают на сценах театров «Астана Опера», ГАТОБ имени Абая, а также принимают участие в международных концертах и конкурсных проектах.

³ https://youtu.be/-2K_TBGbZJE?si=PS5vaM2vU5q_SFb5 – Бибигуль Тулегенова «Булбул».

⁴ https://youtu.be/yoPIF9_WzJs?si=b9i5rgciroOnMaTE – Толкын Забирова «Булбул».

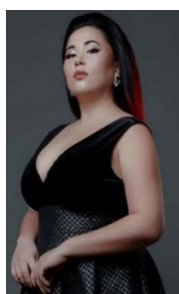
⁵ <https://youtu.be/H4STNHjf2wQ?si=xNIS5VRS2Wwg56hS> – Зарина Алтынбаева «Булбул».



Толқын Забирова



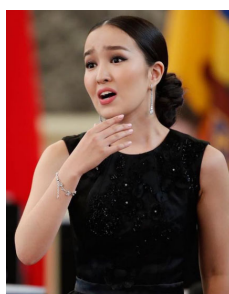
Зарина Алтынбаева



Салтанат
Ахметова



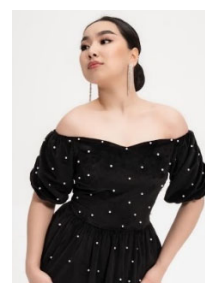
Айзада Капонова



Мадина
Абиљдина



Аделина
Мухаметжанова



Аружан
Алпысбаева

Вместе с тем романс продолжает развиваться не только в академической, но и в эстрадной музыкальной среде, приобретая новые формы исполнения. Одним из таких примеров стало совместное исполнение песни «Булбул» Жанар Дугаловой и Жамили Жаркынбаевой⁶ (2015). Жанар Дугалова является одной из ярких представительниц современной казахстанской эстрады, тогда как Жамиля Жаркынбаева – оперная певица. Их творческий дуэт объединил два разных направления вокального искусства. В этой интерпретации произведение было адаптировано для исполнения дуэтом и представлено в современной эстрадном варианте. Несмотря на использование электронных инструментов и современного ритмического сопровождения, певицы сохранили сложные вокальные пассажи в высоком регистре, передающие образ соловья. Кульминация произведения в данной интерпретации принадлежит Жанар Дугаловой. В завершающей части романса певица использует свистковый регистр, благодаря чему звучание приобретает особую легкость и яркость, создавая выразительный образ соловьиной трели. Этот вокальный прием усиливает эмоциональное воздействие произведения и придает современной интерпретации индивидуальное звучание, сохраняя при этом узнаваемый мелодический образ романса «Булбул».

Еще одной современной исполнительницей романса «Булбул» является Акбота Керимбекова⁷ (2018). В ее исполнении произведение приобрело новое эстрадное звучание, при этом сохранив свою академическую основу. Певица сочетает классический вокал с элементами казахской исполнительской традиции, благодаря чему романс звучит по-

⁶ <https://youtu.be/iPdJMH85-TY?si=YaeXqHUSr7EJSrGU> – Жанар Дугалова и Жамиля Жаркынбаева «Булбул».

⁷ <https://youtu.be/OrDuQSG5O-8?si=xTgVcE6Z20ibW7P2> – Акбота Керимбекова «Булбул».

новому, но не теряет своего первоначального характера. Музыкальное сопровождение также отличается от традиционного академического исполнения. В аранжировке используются современные эстрадные и этнические элементы, которые дополняют произведение. Такое сочетание классической музыки и современных приемов делает романс более доступным для широкой аудитории.

Романс «Булбул» считается одним из самых сложных произведений казахстанского вокального репертуара. Для его исполнения певец должен обладать широким диапазоном, хорошей вокальной техникой и умением точно исполнять сложные колоратурные фрагменты. Именно поэтому далеко не каждый эстрадный исполнитель включает это произведение в свой репертуар.

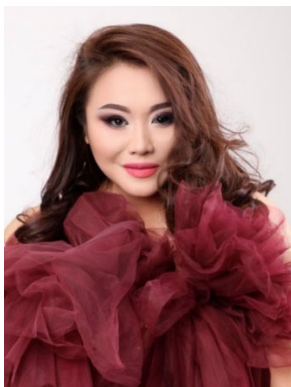
Похожий подход можно увидеть и в исполнении Лали Бакытнуркызы⁸. В этой версии также сохранены основная мелодия, лирическое настроение и вокальные особенности романса, однако музыкальное сопровождение стало более современным. Вместо традиционного академического оркестра используются электронные инструменты (электропианино, флейта и т.д.) и мягкая эстрадная аранжировка, благодаря чему произведение звучит как современная лирическая баллада. При этом исполнительница бережно сохраняет мелодическую линию и вокальные украшения, заложенные Латифом Хамиди.

Совсем иначе романс представлен в исполнении Меруерт Тойбековой⁹. В этой версии произведение приобрело ярко выраженное танцевальное звучание, характерное для современной эстрады. Электронные ритмы, синтезаторы и современная аранжировка заметно изменили его характер. При этом основная мелодия романса сохранилась, однако воспринимается уже как часть современной эстрадной композиции.

Сравнение различных интерпретаций показывает, что романс «Булбул» продолжает жить и развиваться в современной музыкальной культуре. Одни исполнители стремятся сохранить его традиционное звучание, изменяя только аранжировку, а другие предлагают более современную эстрадную версию.



Жанар Дугалова



Акбота Керимбекова



Лала Бакытнуркызы



Меруерт
Тойбекова

В заключение отметим, что романс успешно выдержал испытание временем. Он продолжает интерпретироваться представителями разных поколений, звучит на концертных сценах в Казахстане и за его пределами, объединяя академические и современные традиции и направления. Именно поэтому «Булбул» и сегодня остается важной частью

⁸ https://youtu.be/iatk_19nAkI?si=sYldY_xdrJbbtiyb – Лала Бакытнуркызы «Булбул».

⁹ <https://youtu.be/9pvVjmwE9Pg?si=MwnGwpuyOZAQauz8> – Меруерт Тойбекова «Булбул».

национального музыкального наследия и одним из символов казахстанской вокальной культуры.

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Proceedings of the 13th International Scientific Conference «Research
Retrieval and Academic Letters» (July 9-10, 2026). Warsaw, Poland, 2026.
124p

editor@publisher.agency

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