Original Article

Prospects Of Digitalization Of Craftsmanship Development In The Region

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Abstract

The development of the digitization system of craft development in the region and the theoretical foundations of the empirical model construction and forecasting mechanisms using information and communication technologies have been improved. A mathematical apparatus for creating a complex numerical econometric model of crafts in the region has been developed.

Keywords: Transformation process, strategic directions, BIM technologies, crafting infrastructure, Bigdata and artificial intelligence, Digital platforms, IoT technology, Blockchain technology, econometric model, forecast results.

Introduction. Craft has a special place as a consistent and stable factor of economic development in the world. "Dinka" company, which is designed to find foreign buyers for products produced by Argentine artisans, receives 35 percent of sales in return for the delivery of products by local artisans, and the company has established cooperative relations with stores in neighboring Chile, Peru, and Ecuador. Among the Asian countries, Vietnamese folk handicraft products took the 8th place in the world in terms of export volume and amounted to 367 mln. has a dollar income. In the same way, China and Germany are now widely engaged in the export of handicraft products [28].Today, crafts are an urgent issue for the sustainable development of the economy of the countries of the world.

In our country, crafts are the cradle of our national-traditional values, the national spiritual heritage left by our ancestors. In our country, there are seven generations of successors of craftsmen who continue the thousand-year-old crafts of our masters.

Handicraft is our national product, which expresses the beauty in the heart of the craftsman through manual work. There are many master craftsmen in Kashadarya region. To develop their crafts, to sell their products and to increase their income, they exchange experience with artisans from Fergana, Bukhara, and Namangan regions. Wide promotion of handicrafts in the remote mountainous regions of our region, and at the same time, to help artisans to increase their apprentices and to open their own businesses, and at the same time to increase the number of artisans, to create competition among artisans, and to supply high-quality and cheap products to the domestic and foreign markets. increases the quality of handicraft products and causes them to become cheaper.

Research methods

In many literatures, studies on family handicraft entrepreneurship in the development of handicrafts have been studied [9].

Table 1 Opinions of foreign scientists who researched family crafts as an entrepreneurial activity [3,4,5,6,7].

A. Smith	Considered as the main and advanced form of family business, its production capabilities and functions
G. Becker	The distribution of income in the family has become important in researching the production functions of the household, the distribution of family income from the perspective of gender.

DJ M Keynes	incomes of family farms, consumption and savings behavior, their interaction with the state, scientifically substantiates the adaptation of economic management to rapidly changing conditions.
Anderson RC	Family crafts manship researches related to the development of entrepreneurship were systematized according to directions. In particular, he studied the nature of family business and its differences from non-family businesses
Gallo	studied the role of family business in the development of the economy and industry, as well as the issues of internationalization
Romano CA	studied the capital structure, financial resources and business-oriented expenses and factors affecting the financial decisions of family businesses
Kelly LM	considered the role of the founder in the family firm and issues of planning his strategic behavior
Duh M., Belak J. and Milfelner B	studied the characteristics of cultural and ethical behavior in studying the differences between family and non-family businesses
Basco, R.	a theoretical model of the relationship between family business and regional development was developed
Barkhatova N. M.	Familycraftsmanshipresearched the socio-economic essence, types, classification and problems of development of theoretical conceptual bases of entrepreneurship scientifically and practically.
Smirnova M.M.	it is considered from the point of view of the role of households in the process of formation of macroeconomic balance.

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From the point of view of the evolution of economic theory, it is more important to study the category of "Craftsmanship". In this case, it is enough to justify the place of economic capitals in the economic view, i.e. modernization.

Such terms include "artisan" and "craftsmanship", which are common in economic literature, but little studied, but need to be agreed upon.[22,23]

Based on the above studies, theories of craft development continue in several directions based on specific approaches. It is worth noting that, based on the comparative analysis of local and foreign researches studied within this topic, it is appropriate to expand the following directions in the development of handicrafts:

firstly, crafting is one of the important economic and social categories, forming an additional developing classification system based on the advanced form of economic management and its importance in self-management and employment of the population;[24,25]

Secondly, on the basis of the studied studies, it was concluded that there are very close approaches as well as conflicting opinions in revealing the socio-economic nature of crafts. This limits the possibilities of applying single approach methods to the studied object. These are related to different terminological interpretations of craft;

Thirdly Research on the development of family craft enterprises was systematized by directions. In particular, the essence of family entrepreneurship and its different aspects from non-family enterprises [15], the role of family business in the development of economy and industry and issues [16], family business's capital structure, financial resources and business expenses, and factors affecting financial decisions [17] the role of the founder in the firm and the issues of planning his strategic behavior (Kelly & Kets de Vries), [18] the characteristics of cultural and ethical behavior in studying the differences between family and non-family businesses. In this regard, Russian scientists (Barkhatova; Volkov; Kalendjian; Korchagina; Korolev; Chernitsky) familycraftsmanshipsocio-economic essence, types, classification and problems of development of theoretical conceptual foundations of entrepreneurship were scientifically and practically researched.

Result and discussion

In new Uzbekistan special importance is attached to further development of handicraft activities and to support the entrepreneurial activity of the population in this area and to reduce poverty through the development of handicrafts. "Poverty reduction means the implementation of a comprehensive economic and social policy to awaken the spirit of entrepreneurship in the population, fully realize the inner strength and potential of a person, and create new jobs" [21]. Today, the directions of goods and goods (works, services) produced by craftsmen in Uzbekistan have increased from 25 to 34.

In order to export handicraft products from our country to more than 20 countries of the world (Germany, Switzerland, Russia, Italy, England, Korea, Malaysia, Azerbaijan, Latvia, Finland, India, France, Greece, Turkmenistan, Iran, USA, Ukraine, Turkey, China, Spain) 113 exhibitions and fairs are planned [29]. In solving these tasks, the deepening of scientific research in the areas of increasing the role of crafts in the national economy, especially in the development of the service sector, is of particular importance.

Decree of the President of the Republic of Uzbekistan dated November 17, 2017 No. PF-5242 "On further development of handicrafts and comprehensive support measures for craftsmen", Decree of the President of the Republic of Uzbekistan No. PQ-77 dated December 30, 2021 "On the support system for handicraft activities" on further improvement measures"[30], PF-60 of the President of the Republic of Uzbekistan dated January 28, 2022 "On the development strategy of New Uzbekistan for 2022-2026"[31], and PQ of the President of the Republic of Uzbekistan dated November 28, 2019 - Decision No. 4539 "On additional measures for the further development of handicrafts and support of handicrafts" [32], this article is of great importance in the performance of tasks related to handicraft activity.

With the initiatives of the President of our country, attention is being paid to digitalization of handicrafts, in order to create convenience for the population, while respecting the human interest and human dignity in all spheres. In this regard, deep changes, democratic renewal of our society, consistent reform and liberalization of all aspects of political and socio-economic life, modernization and digitization processes are developing rapidly. It is clear from this that it is not an exaggeration to say that the huge tasks set and consistently implemented in the way of forming a strong civil society are creating a solid foundation.

At the current modernization stage of our country's development, digitalization of the economy is one of the most urgent problems facing our national economy.

Therefore, the transformation, modernization, digitization and introduction of innovative ideas into entrepreneurship is one of the most important directions of development of handicrafts. In the near future, handicrafts will be the most important factor in the continuous development of our country's economy, the leading force leading the way forward.

A number of studies are being conducted in Uzbekistan to improve the role of family crafts in the development of handicrafts, including the following priority directions:

- assessment of development trends of family crafts in the economy and justification of prospective directions;
-increasing the role of family crafts in the system of population employment and labor relations in the processes of digital transformation;
- governance, social capital, inheritance and gender issues in family crafts;
- a systematic approach to identifying problems in family crafts;
- improvement of organizational and economic mechanisms of family craft development;
- assessment of the role of family crafts in regional development.

Based on the tasks, the main five strategic directions for organizing the process of digital transformation of crafts were proposed (Table 2).

In our opinion, in our countrycraftsmanshipIt is necessary to create electronic passports, to form an electronic database containing the volume, price and other information of the offered goods and services [26] . Such databases are widely used in advanced developed countries such as Singapore, South Korea, Japan, and Germany.

Thus, the processes of digital transformation in crafts have a high profile, which in turn leads to an improvement in the quality of life of the population.

In the Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis, "Active transition to the digital economy will be one of our most important tasks in the next 5 years." Although our country has risen to 8 points in the "International Information and Communication Technologies Development Index" in 2019, we are still far behind. Most of the ministries, agencies, and enterprises are completely far from digital technologies, and this is also true [2], they said.

Table 2 The main strategic directions of organizing the process of digital transformation in the craft industry

Strategic directions of the transformation process	**Tasks**
Application of BIM technologies in the life cycle of craft infrastructure objects	- Digitization based on BIM covers all processes of the life cycle of craft infrastructure objects, ensures an increase in the quality of use and service provision;
To bigdata and artificial intelligence	- formation of a single integrated system of crafts;

based general Forming a "system of systems".	- the complete system includes information about the city infrastructure and a number of other information; - the use of big data technology and artificial intelligence in the process of business management
Digital platforms and IoT[1]using technology	- introduction of Internet technology in the process of obtaining information directly from the sensors of business objects, as well as meters;
In craft management use of information-analysis tools	- Expanding the use of information-analytical tools, including semantic analysis of text and speech, multidimensional statistical analysis and processing of complex events in the process of reviewing citizens' appeals;
Implementation of Blockchain technology	-use technology to increase craft transparency, transfer digital deals, documents, voting results, as well as develop crowdsourcing projects and monitor the work done.

BIM- is a technology that allows creating a multidimensional model of a building object, which contains all the information about it. In addition, this model is used not only for construction, but also for the operation of the facility. Therefore, it is completely wrong to think that BIM is only a graphic 3D projection. The possibilities of technologies are very wide. Information modeling implies a completely new approach to the construction and management of the building, in which absolutely everything is considered. All this allows to avoid possible changes in the design, reduce construction costs and, most importantly, save time. The introduction of BIM has made it possible to make the right decisions at the stages of the life cycle - from investment to commissioning and even demolition.

However, this technology also requires financial costs. In particular, it is necessary to purchase special software and equipment for training. But in the future, these costs will be covered by reducing the costs of designing and organizing the construction of the building [27].

Today, digitalization of handicrafts leads to the collection of information about handicrafts in the world markets, quick finding, that is, reduction of excessive labor, time, and expenses.

In this algorithm, the mechanism of selling handicraft products in the domestic and foreign markets will be explained in detail. Supporting artisans and helping them sell their products will contribute to the future development of the industry. Our skills have been around for a long time'As a country with a developed science, today there are a number of touristic boundaries, mausoleums and monuments, places of pilgrimage. Besides, our Uzbek people are centuries oldThey are a dream-enthusiastic people who continue their traditions. For this reason, we aim to enrich our country's domestic markets, wedding ceremonies, tourism regions, state and non-state organizations with craft products, and provide convenient options to the customer by creating an electronic catalog using the ability of graphic programs in order to provide quality service to the customer without unnecessary inconvenience.

Evaluating the development of craft enterprises on the basis of trend models makes it possible to compare the connections between several collection elements. Therefore, in our research, in order to forecast the volume of products developed by craft enterprises, the following steps should be carried out in determining the trend models using the extrapolation method:

- factors participating in the model were selected by determining pair and private correlation coefficients;
- parameters of regression equations are determined;
- the statistical significance of the constructed econometric model is checked. The reliability of the econometric model is evaluated by several criteria, namely, the significance level of the regression coefficients according to the Student's t-criterion, the significance of the econometric model using the Fisher's F-criterion, the presence of autocorrelation in the model according to the Darbin-Watson criterion, the overall effect of the factors according to the coefficient of determination R2;
- we generate forecast results through the created optimal trend model.

The constructed econometric model can be considered as the best econometric model [27] corresponding to the studied process, and then based on this model, the main indicators of the enterprise can be forecast for the coming years.

The main indicators of handicraft activity in Kashkadarya region were determined as follows:

[1]Hawkins J. The Creative Economy: How People Make Money from Ideas. London: Penguin, 2001, 263 p.

Volume of products developed by craft enterprises (billion soums) - Y;

Share of people engaged in craft activities in small business and entrepreneurship (in percent) -X1;

Investments in craft activities (million soums) - X2;

Number of craft enterprises in active state (thousands) -X3;

Volume of craft services (million soums)-X4;

The values of these factors are presented in Table 3.

We define a linear regression equation as an econometric model of craft activity development in Kashkadarya region. In our case, the general view of the four-factor linear regression equation is written as follows:

$$Y = a_0 + a_1X_1 + a_2X_2 + a_3X_3 + a_4X_4 \qquad (1)$$

Table 3 Statistical data on the volume of products developed by handicraft enterprises in Kashkadarya region and the factors affecting it
(real values)

Years	The volume of products developed by craft enterprises (million soums) Y	Share of people employed in craft activities in small business and entrepreneurship (in percent) X1	Investments in craft activities (million soums) X2	Number of craft enterprises in active state (thousands) X3	The size of craft services (million soums) X4
2002	1040.6	2.83	394.18	0.283	275.1
2003	1310.4	2.91	585.24	0.306	337.6
2004	1529.6	3.17	735.73	0.336	407.4
2005	1873.2	2.97	885.89	0.378	468.3
2006	2410.8	2.99	994.32	0.403	602.7
2007	3057.6	3.32	1369.82	0.473	764.4
2008	3241.6	4.5	1495.91	0.509	795.4
2009	3595.2	4.6	1768.66	0.552	898.8
2010	4309.2	4.75	2365.43	0.649	1077.3
2011	5422.8	4.88	2682.18	0.665	1354.5
2012	6207.6	5.12	2941.99	0.798	1551.9
2013	7417.2	5.36	3482.25	0.816	1854.3
2014	9770.5	5.31	4736.78	0.828	2527.6
2015	11971.8	5.9	5727.27	0.855	2992.5
2016	14120.4	6.12	6598.32	0.869	3530.1
2017	16321.6	8.7	6996.16	0.888	3830.4
2018	18681.6	9,13	8981.54	0.958	4670.4
2019	22327.6	8.74	10103.08	0.971	5331.9
2020	30609.6	9.21	14716.15	0.992	7652.4
2021	39253.2	9.32	18412.48	1,117	9813.3

We build the empirical model using MS Excel

Table 4 Building a linear empirical model based on the volume of products developed by handicraft enterprises in Kashkadarya region and the factors affecting it

Regression statistics					
Mnojestvennyy R		R-squared	Normalized R-squared	Standartnaya oshibka	Nabludeniya
0.999808683		0.999617403	0.999515377	232.9856526	20
Dispersion analysis					
	df	SS	MS	F	Significantly F

Regression	4	2127363969	531840992,3	9797.684549	0.00000000
Ostatok	15	814234,7149	54282,31432		
Itogo	19	2128178204			
		Coefficient	**Standartnaya oshibka**	**t-statistics**	**P-Znachenie**
Y-peresechenie		-617.9393807	221.7528035	-2.786613612	0.013828061
Peremennaya X 1		286.9639174	73.83926673	3.886332166	0.001461415
Peremennaya X 2		-0.871256267	0.406124698	-2.145292498	0.048707349
Peremennaya X 3		-833.0880684	539.9548602	-1.542884655	0.143689759
Peremennaya X 4		5.524631658	0.760329855	7.266098552	0.000000276

Using Table 5, we write expression (1) as follows:

$$Y = \underset{-2,787}{-617,94} + \underset{3,886}{286,96}\,X_1 - \underset{-2,145}{0,871}\,X_2 - \underset{-1,543}{833,088}\,X_3 + \underset{7,266}{5,525}\,X_4 \quad (2)$$

It can be seen from (4) that if the values determined by factor 3 are analyzed, the coefficient in front of X3 is insignificant (|-1.543|<2.1); the hypothesis of linearity of the model is not fulfilled only by this factor (p=0.14>0.05). In all other cases, it can be noted that a qualitative empirical model has been built. Then we write the adequate condition of (2) as follows

$$Y = -746{,}81 + 211{,}47 * X_1 - 0.95 * X_2 + 5{,}66 * X_3 \quad (3)$$

-3.49 3.67 -2.26 7.19

Here it is appropriate to check that there is no autocorrelation in the model (3.3.3), then we check it according to the Darbin-Watson criterion:

$$DW = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2} = \frac{\sum_{t=2}^{T} e_t^2 + \sum_{t=2}^{T} e_{t-1}^2 - 2\sum_{t=2}^{T} e_t e_{t-1}}{\sum_{t=1}^{T} e_t^2} = 2 - 2\frac{\sum_{t=2}^{T} e_t e_{t-1}}{\sum_{t=1}^{T} e_t^2} \approx 2(1-\rho_1)$$

here, ρ_1 - correlation coefficient of the first order. Positivity according to this criterion is explained by the value of DW around 2.

We calculate the correlation coefficient of the first order on the selected factors, i.e $p_1 = -0,2368$. In that case $DW = 2,4735$ equality is appropriate. This means that the quality of the model is high.

According to the model, we determine the trend models for the exogenous factors of this model in order to calculate the forecast indicators of the economic growth of the production of handicraft enterprises in the Kashkadarya region. We use MS Excel for this:

If we analyze the forecasts obtained based on the analysis of trend models calculated above and the results obtained from them, we can see this (Table 5).

Table 5 Forecast of the volume of products developed by handicraft enterprises in Kashkadarya region and the factors affecting it

Forecast years	**The volume of products developed by craft enterprises (million soums) Y**	**Share of people employed in craft activities in small business and entrepreneurship (in percent) X1**	**Investments in craft activities (million soums) X2**	**The size of craft services (million soums) X4**
2022	47037,15778	9.79	24248.92	12138.21
2023	55969.95359	10,17	29229.31	14536.44
2024	66612,76484	10.54	35232.61	17408.5
2025	79298,43342	10.91	42468.9	20848.01
2026	94423,58474	11.29	51191.43	24967.09

(Table 5) shows that according to the forecasts obtained from the model of the production volume developed by handicraft enterprises in Kashkadarya region, compared to 2020, it was predicted to increase by 1.007 times by 2021, and by 2026 by 2.41 times.

Conclusions. Based on the above, it can be concluded that one of the most important factors that allows Uzbekistan to increase its level of competitiveness with foreign craft enterprises is the creation of favorable conditions for the creation of a whole branch of handicrafts and digitalization of the industry. And this bDigitalization of handicrafts today leads to the collection and quick finding of information about handicrafts in the world markets, which means reducing unnecessary labor, time, and costs. For this reason, we aim to enrich our country's domestic markets, wedding ceremonies, tourism regions, state and non-state organizations with craft products, and provide convenient options to the customer by creating an electronic catalog using the ability of graphic programs in order to provide quality service to the customer without unnecessary inconvenience. Through digitization, it will be possible to view and buy the products of artisans operating in all regions of the region at the same time. Payment system and delivery service will also be launched on this platform.

In both cases, the expected result is a high level of recovery. This is the increase in quality products and the formation of a healthy competitive environmentinnovative approach, formation of teacher-apprentice schools, increase of new jobs, increase of income of the population and most importantly, provision of employment for the population of our country will in turn lead to reduction of poverty.

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