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# IMPROVING TECHNOLOGIES OF REGIONAL FOLK CRAFTS PRODUCTS BASED ON A SYNERGIC APPROACH

Norqobilova Feruza Abduhomidovna,
Head of the Department of "Business and Management" of Karshi State Technical University, Doctor of Philosophy, Associate Professor.
https://orcid.org/0009-0009-9911-5070
fnorqobilova85@gmail.com

**Annotation:**
This article explores the integration of 3D technologies and the Internet of Things (IoT) into the field of handicrafts. The main objective is to modernize traditional production processes, improve product quality, enhance production efficiency, and ensure global competitiveness through proposed recommendations and solutions.

**Key words**: Folk crafts, digital technology, product, patenting, intellectual, subsidy, synergistic, modernization.

## Introduction:

As a result of comprehensive measures being implemented in Uzbekistan to develop national handicrafts, folk decorative and applied arts, and to provide all-round support to specialists in this field, the number of folk artisans in our country has increased eightfold in recent years, the number of apprentices has grown ninefold, and the number of people employed in the sector has reached 250,000.

In particular, significant efforts are being made in the regions to further develop the applied art of folk artisans, including the creation of catalogs of national folk craftsmen, the organization of international exhibitions and competitions, and the inclusion of folk artisans in the tourism register. At the same time, it is necessary to take additional measures to fully utilize unused opportunities of family entrepreneur-artisans through a community-based approach, to further expand the system of experience exchange among artisans, and to find new markets for handicraft products.

The system for involving the regional population in the field of folk crafts is being improved, with reforms steadily continuing to teach young people vocational skills in local communities based on the traditional "master-apprentice" model, ensure their employment, reduce poverty, and develop handicrafts.

In this regard, two key presidential decrees have been adopted: the Resolution No. PQ-55 of the President of the Republic of Uzbekistan dated December 20, 2021, "On additional measures for the development of family entrepreneurship and the expansion of income sources for the population" [1], and the Resolution No. PQ-77 dated December 30, 2021, "On further improving the system of support for handicraft activities" [2].

These resolutions aim to create employment opportunities for the population, finance their projects, develop the handicraft sector, and support the activities of artisans. They stipulate the allocation of preferential loans at an annual rate of 14% to members of the "Hunarmand" Association for purchasing equipment, spare parts, and raw materials for production needs, as well as for establishing handicraft development centers, "master-apprentice" schools, building or purchasing home-museums and workshops, for a period of up to 3 years, and for replenishing working capital for up to 18 months. These measures have led to noticeable positive changes in the field of folk handicrafts.

The digitalization of folk crafts represents a modern form of the development of digital handicrafts that can be observed today. Evaluating the development of folk crafts in the region based on trend models and studying issues related to folk craftsmanship are among the most pressing matters of the present time.

The economic challenges of developing folk crafts and the issues of digitalizing national handicrafts in the regions—particularly through the advancement of applied arts—have been studied by several foreign economists. Notably, Basco [3] has explored aspects of this area, while Banalieva, Eddleston, Zellweger, and Steier [4] have examined the positive aspects of family-based handicrafts in the national economy from the perspective of institutional approaches and corporate governance, highlighting their unique characteristics.

Within Uzbekistan, scholars such as A. O'lmasov [5], D.T. Yuldashev, and O.M. Pardaeva [6] have investigated the theoretical model of the relationship between

family business and regional development. Their research focuses mainly on the advantages of folk crafts within the context of family business. However, these works do not fully explore the economic and social nature of digitalization in folk craftsmanship.

At present, the ongoing work in the field of digitalizing folk crafts and identifying future prospects highlights the need for more serious scientific research and in-depth analysis of the issue.

This research makes extensive use of mathematical modeling methods—particularly correlation analysis and regression-based trend modeling—to develop an empirical model for identifying prospects for the development of folk crafts.

There are several systemic issues in the modernization of folk craft technologies using a synergistic approach and in patenting regional handicraft products as intellectual property. Key barriers include a lack of knowledge among artisans and small entrepreneurs in the field of intellectual property, the complexity and cost of obtaining patents, and insufficient access to consultation services.

The integration of digital technologies, especially 3D modeling and IoT devices, into the field of handicrafts offers the possibility to fundamentally modernize the production process. With the help of 3D technologies, it is possible to quickly and accurately design products, prepare personalized orders, and produce models on a large scale. IoT devices enable real-time monitoring of raw material quality, environmental parameters, and technological operations during the production process. This helps improve product quality, ensures efficient use of resources, and enhances production efficiency.

There are certain limitations in implementing digital technologies in the field of handicrafts. First and foremost, there is a lack of necessary technical infrastructure and high costs associated with introducing 3D and IoT technologies. Low levels of digital literacy among local artisans and limited skills in using modern software also hinder effective implementation of these technologies. Furthermore, a conservative attitude and cautious approach toward technological innovations within traditional craft culture slow down the process of innovation integration.

This diagram illustrates the step-by-step process of patenting products as intellectual property. The first stage requires the creation of an original product or technology.

In the second stage, it is checked whether the innovation meets the requirements for patentability. In the third stage, a prepared patent application is formally submitted. Finally, in the fourth stage, patent rights are protected and maintained. Distinct graphic symbols and colored blocks are used for each stage, reflecting an organized and systematic approach to the patenting process.

Essence of the Synergistic Approach in National Handicrafts

The essence of the synergistic approach lies in modernizing folk craft technologies through the integration of various sectors — traditional handicrafts, modern design, digital technologies, environmentally friendly production, and marketing strategies. This approach harmonizes the strengths of each sector to achieve innovative and functional outcomes.

In conclusion, the expected outcome is the revival and development of traditional crafts that have existed in our country for centuries but are gradually disappearing in recent years. This includes preserving and passing down our national heritage to future generations, promoting our national identity, customs, and traditions to both local and international audiences through handicraft products. It also aims to create employment opportunities for the population in underdeveloped and remote mountainous regions of our republic. Even without advanced technologies, it is possible to produce handicraft products using locally available raw materials (such as wool, silk, leather, clay, wood, metal, etc.), thereby providing a source of income for local communities.

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