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TRANSFORMATION AND INNOVATION OF CHINESE ARTIFICIAL CRAFT PRODUCTS IN THE AI ERA: A FIELD CASE STUDY OF AN EXPORT MANUFACTURER

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Abstract: Chinese manufacturers of artificial flowers and other artificial craft products face slower demand, more cautious overseas buyers, and stronger price competition in the years after the COVID-19 pandemic. This paper presents a field case study of HappyArt, a business-to-business exporter of artificial flowers, plants, and potted plants with nearly twenty years of history. The evidence comes from a two-week on-site internship in July 2026, together with company materials and information shared by managers. After a strategy meeting in January 2025, the firm innovated along three lines. In products, it raised the share of varieties made with 3D printing and AI-assisted color screening from about 10% to 60%, increased annual design-patent applications from at least four to at least twenty, and offered 60 or more colors per product. In the market, it replaced paid sampling with customer co-creation and absorbed the sampling costs, about 5% of annual expenses. In organization, it introduced weekly cross-departmental meetings and a "Your Eyes in the Factory" reporting practice. Management reports that the 3D+AI product line grew by about 20% in 2025 and expects similar growth in 2026, while many competitors contracted. The case suggests that, for labor-intensive craft manufacturers, incremental innovations that reinforce one another may be more practical than disruptive change. The main limitations are the single case, the short observation period, and the use of company-reported figures.
Keywords: Artificial flowers; 3D printing; AI-assisted design; Customer co-creation; Organizational innovation; Incremental innovation; Export manufacturing; Case study

1 INTRODUCTION

China is a major producer and exporter of artificial flowers, plants, and other decorative craft products. Many firms in this sector are small or medium-sized, rely on skilled manual work, and serve overseas wholesalers and retailers rather than end consumers. After the COVID-19 pandemic, these firms faced a harder environment. Overseas buyers became more cautious, product preferences changed quickly, and competition among suppliers became more intense.

This paper studies how one such firm responded. HappyArt (Hanming Crafts) is an export-oriented manufacturer of artificial flowers, plants, and potted plants that has operated for nearly twenty years. Its stated vision is to "bring quality products into every household around the world." Before the pandemic, its business-to-business (B2B) sales grew steadily. The pandemic years, however, weakened the firm's capacity for innovation and its relationships with customers. When overseas clients returned for face-to-face meetings from 2023 onward, management found that the market had become more competitive, customers more demanding, and the company slower to respond.

In mid-January 2025, the senior management team held a closed-door meeting to assess customers, market trends, and internal organization. The meeting set a three-year plan built on innovation in three areas: products, market engagement, and organization. The author joined the firm for a two-week internship beginning on July 1, 2026, and observed how this plan was being carried out.

The paper addresses one question: *How can a labor-intensive artificial craft exporter use AI-related tools and organizational change to regain competitiveness after a period of decline?* It makes three contributions. First, it documents concrete innovation measures and the indicators the firm uses to track them. Second, it interprets these measures with established innovation concepts. Third, it argues that the three types of innovation depend on one another. Faster AI-assisted prototyping makes free co-created samples affordable, and closer internal coordination is needed to deliver them.

The rest of the paper is organized as follows. Section 2 reviews related concepts. Section 3 describes the method. Section 4 presents the case findings. Section 5 discusses their implications, and Section 7 concludes.

2 RELATED CONCEPTS

2.1 Types of Innovation

Schumpeter described innovation as new combinations of products, methods, markets, sources of supply, and forms of organization [1]. The third edition of the Oslo Manual turned this idea into four measurable types: product, process, marketing, and organizational innovation [2]. The three areas pursued by HappyArt map closely onto this typology. Its 3D printing and AI color screening also count as process innovation, because they change how products are made.

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Christensen distinguished *sustaining* innovations, which improve existing products for existing customers, from *disruptive* innovations, which create new markets or displace incumbents [3]. Most change in traditional manufacturing is incremental. The dynamic capabilities view adds that firms survive in changing environments by repeatedly reconfiguring their resources and routines [4].

2.2 AI and Digital Fabrication in Design

Verganti *et al.* argue that artificial intelligence changes design practice by automating parts of problem solving. Human designers then concentrate on deciding which problems are worth solving [5]. Berman notes that 3D printing lowers the cost of producing small batches and custom variants [6]. Together, these technologies reduce the time and cost of turning an idea into a physical sample, which matters in fashion-driven product categories.

2.3 Customer Co-creation

Prahalad and Ramaswamy describe co-creation as a shift from firm-centered value creation to value created jointly with customers [7]. Vargo and Lusch make a related argument: the customer is always a co-creator of value [8]. Von Hippel shows that "lead users," who face needs before the wider market, are a useful source of new product concepts [9].

2.4 Organizational Integration and Transparency

Griffin and Hauser review evidence that integration between research and development (R&D) and marketing improves new-product success [10]. Buell *et al.* find that showing customers the work done on their behalf, which they call operational transparency, increases perceived value and trust [11]. Damanpour's meta-analysis links organizational innovation to structural features such as communication and specialization [12]. Kotter warns that change efforts often fail when urgency is low, coalitions are weak, or resistance is not addressed [13].

3 METHOD

This study uses a single exploratory case design, which suits "how" questions in real settings where the researcher has little control over events [14]. The evidence comes from three sources: on-site observation during a two-week internship that began on July 1, 2026; company materials, including product sample photographs, design-patent certificates, and trademark registrations; and information shared by company managers about the January 2025 strategy meeting, the measures adopted, and the firm's own performance figures.

The quantitative indicators in this paper are *company-reported*. They were not independently audited, and the short observation period did not allow before-and-after measurement. The findings should therefore be read as a descriptive account of the firm's strategy and its reported results, not as causal estimates.

4 CASE FINDINGS

Figure 1 summarizes the three innovation areas and how they relate to one another. Table 1 lists the main measures and reported indicators.

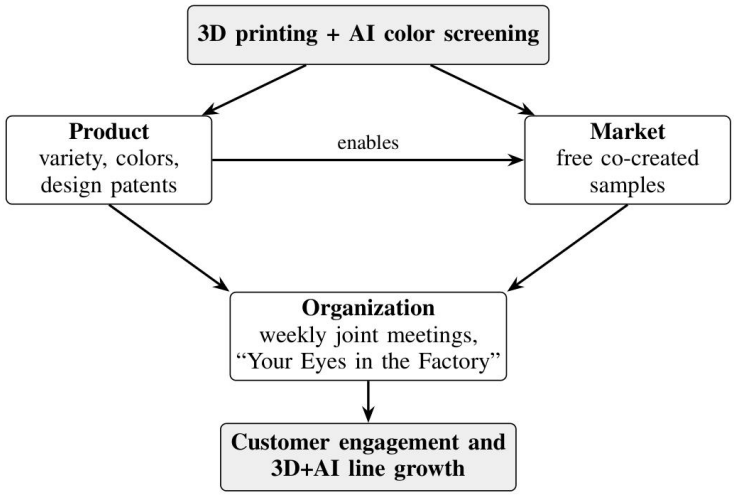


Figure 1 Analytical Framework. AI-assisted fabrication lowers the cost of new variants. This makes free co-created samples affordable. Delivering them depends on cross-departmental coordination.

Table 1 Innovation Measures and Company-Reported Indicators

Area	Measure	Indicator (before → after)
Product	3D printing + AI color screening	Share of varieties: ≈10% → 60%

Area	Measure	Indicator (before → after)
	Design-patent applications	≥4/yr → ≥20/yr (from 2025)
	Mixed-flower designs	≈200 new varieties in one month
	Color development	≥60 colors per product
Market	Free co-created samples	Extra cost ≈5% of annual expenses
Organization	Weekly meetings of 5 departments	Held every Wednesday morning
	Staff restructuring (2025)	15% exits; 30% new hires
Outcome	3D+AI product line	+≈20% (2025 vs. 2024); +≈20% expected in 2026

4.1 Product Innovation

4.1.1 3D printing with AI-assisted color screening

Before 2025, the firm had tested 3D printing combined with AI-assisted design and AI-based color screening, but it had not used this approach widely. After the strategy meeting, management raised the share of product varieties made with this approach from about 10% to 60%. The priority was high-volume items such as moth orchids, lilies, and gladioli. Figure 2 shows 3D-printed lilies in which both the flower heads and the leaves are printed. The firm views the new process as a step up in product quality.



Figure 2 3D-Printed Lilies. Both flower heads and leaves are produced with 3D printing; the numbered samples show color variants.

4.1.2 Design patents and trademarks

Before 2025, the company filed at least four design-patent applications per year. From 2025 it has filed at least twenty per year. For European and American B2B buyers, exclusive designs help the firm reach the market first and build a protective "moat" of patents and trademarks. Figure 3 shows examples: Chinese design patents for packaging pots, flower-pot trays, pot covers, bouquet holders, and a rose flower ball, as well as trademark registrations in China and Germany.

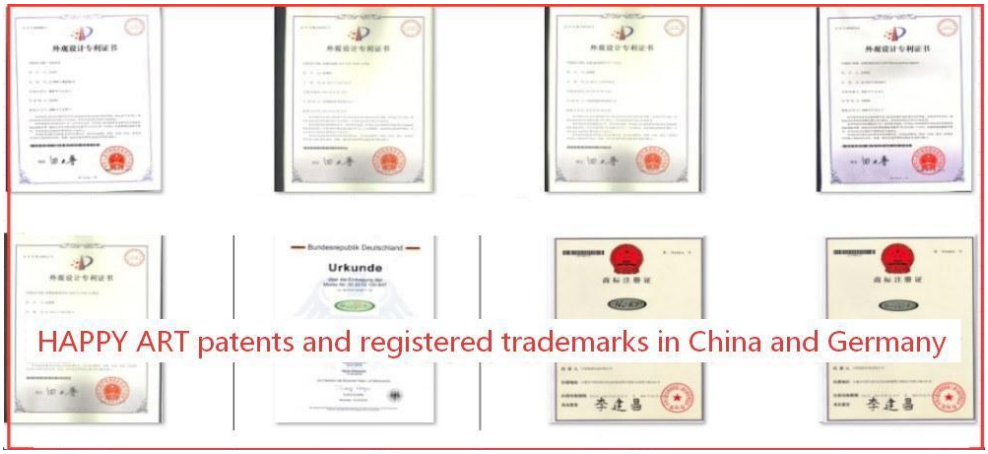


Figure 3 Examples of the Firm's Intellectual Property: Chinese Design-Patent Certificates (Top Row and Bottom Left) and Trademark Registrations in Germany and China (Bottom Row). The overlay text reads "HAPPY ART patents and registered trademarks in China and Germany."

4.1.3 Mixed-flower designs

The firm invested in mixed designs that combine flower types, materials, and foliage, such as rose–peony–lily and rose–chrysanthemum–greenery. Within one month it launched nearly 200 varieties for wall-mounted, fan-shaped arrangements, and management described customer feedback as very enthusiastic. Figure 4 shows two examples.



Figure 4 Mixed-Flower Bouquets. Left: dahlia, hydrangea, and greenery. Right: rose, hydrangea, and greenery.

4.1.4 Color innovation

Before the pandemic, the company released new colors each year based on the color trends shown at the February trade fair in Frankfurt. With the new 3D printing materials, it now develops 60 or more colors for each product, which widens its color range considerably. Figure 5 shows a chrysanthemum series with more than 80 colors and a rose color chart.



Figure 5 Color Development. Left: chrysanthemum series with more than 80 colors (the circled label reads "80+ chrysanthemum colors"). Right: rose color chart with numbered variants.

According to management, these product changes made communication with customers smoother. More samples led to repeat orders, overseas buyers showed more interest, and customers gave more suggestions and more detailed requirements. The firm describes this as a two-way exchange that strengthens both sides.

4.2 Market Innovation

Previously, customers chose samples from the firm's range and paid international shipping themselves. After the pandemic, buyers became reluctant to pay for samples. The firm switched to co-creation. A customer supplies an idea, and the firm uses its 3D+AI workflow to produce renderings and color options that match the target market. If the customer likes the resulting design, the firm provides physical samples free of charge. It bears the sample cost, international postage, and development cost, which add about 5% to its annual expenses. Demand for samples rose substantially under this policy, and the firm lets later orders show whether each design succeeds in the market.

The firm also encourages customers to pass on design ideas from their own markets, and its design center turns these ideas into products. In one case, a customer who had bought a welcome tree asked for a version shaped like a pavilion. The design team developed the pavilion tree shown in Figure 6, and then extended it into small, medium, and large sizes. This customer acted much like a lead user in von Hippel's sense [9], and the request opened up a new application scenario for the firm.



Figure 6 Customer-Driven Product Extension. Left: original welcome tree. Right: pavilion tree developed at a customer's request.

4.3 Organizational Innovation

Before and during the pandemic, the firm's five departments (foreign trade, development, production, shipping, and finance) had little interaction. The foreign trade department dealt most directly with customers, but the customer needs it collected were rarely explored in depth.

After January 2025, management made customer-oriented service the top priority and introduced new routines. Every Wednesday morning, three meetings take place: a coordination meeting of all five department heads, a production-progress meeting whose results are shared with customers immediately afterward, and a development meeting that reports project progress to customers. The executive general manager leads these meetings, which makes decision-making flatter. Departments now settle cross-functional problems during the meeting itself. When a production problem arises, production staff contact the customer directly rather than going through the sales department.

The firm summarizes this approach with the slogan "Your Eyes in the Factory." Customers receive real-time videos, photographs, and weekly progress reports on each order, showing which stage it has reached. Customers can then pass reliable information on to their own buyers. This practice is an example of operational transparency, which Buell *et al.* link to higher perceived value and trust [11].

4.4 Reported Outcomes and Costs

Management reports that the 3D+AI product line grew by about 20% in 2025 compared with 2024, and expects a further increase of about 20% in 2026. It also estimates that 70% or more of its competitors are shrinking. These figures were not verified independently.

The changes also had costs. Work rhythms had to be adjusted, coordination across departments became harder at first, and some employees resisted the new practices. In 2025 the firm replaced about 15% of its staff and recruited new employees equal to about 30% of its workforce.

5 DISCUSSION

5.1 Incremental Rather Than Disruptive Innovation

Management describes its approach as "micro-innovation": improving what already exists after assessing the market, customers, the firm itself, and its competitors. In Christensen's terms, this is sustaining innovation [3]. For a production-oriented firm that depends on manual work, disruptive change is costly and risky. Improving a proven product line with new tools is more feasible.

5.2 Complementarity of the Three Innovation Areas

The three areas are closely linked, as Figure 1 shows. The 3D+AI workflow lowers the cost and time of producing new variants, which makes free co-created samples financially sustainable. Co-creation in turn raises the number of custom requests. Those requests can only be handled well if sales, development, and production work together and keep the customer informed. This pattern is consistent with the dynamic capabilities view, in which firms gain an advantage by reconfiguring several routines together rather than changing one in isolation [4]. It also reflects the benefits of integrating R&D and marketing [10].

5.3 The Role of AI

In this case, AI supports human work rather than replacing it. The firm uses AI for rendering and color screening, which speeds up exploration of design options. Designers and customers still decide which options are worth producing. This matches Verganti *et al.*'s view that AI automates parts of design while humans focus on sense-making [5]. It also shows that small and medium-sized manufacturers can benefit from AI without large, dedicated AI projects.

5.4 Managing Change

The resistance and coordination problems described above are typical of organizational change. Frequent structured meetings and staff restructuring align with Kotter's advice to build a guiding coalition and remove obstacles [13]. Replacing 15% of employees is a costly step, however, and its long-term effects on morale and tacit craft skills are not yet known.

5.5 Next Steps: Application Scenarios

At the start of 2026, the firm began work on a "second curve" of products focused on application scenarios. Some good products are rarely used in real settings because customers do not know how to use them. The firm therefore teaches

customers how to use its products in different scenes, aiming to raise customer loyalty. This extends co-creation from product design to product use.

5.6 Implications for Other Craft Exporters

Three lessons may apply to similar firms: (1) use AI and digital fabrication to shorten the idea-to-sample cycle; (2) use lower sampling costs to invite customers into co-creation, and protect the resulting designs with intellectual property; and (3) redesign internal routines and customer reporting so that the organization can deliver on these promises.

6 LIMITATIONS AND FUTURE RESEARCH

This study has clear limitations. It covers a single firm and is based on a two-week internship. Most quantitative indicators come from management and were not audited. The observed growth may also reflect factors other than the innovations, such as a general recovery in overseas demand. Future research could compare several firms, track sales and customer data over a longer period, and survey customers directly to measure how co-creation and transparency affect their decisions.

7 CONCLUSION

Facing weaker demand and more cautious customers after the pandemic, HappyArt responded with coordinated innovation in products, market engagement, and organization. Its measures include 3D printing with AI color screening, more design patents, wide color ranges, free co-created samples, weekly cross-departmental meetings, and transparent production reporting. According to management, these measures have helped the firm grow while many competitors shrank. The case suggests that Chinese artificial craft manufacturers can use AI-era tools to renew traditional products. The key is to combine technological tools with changes in how they work with customers and how they organize internally.

COMPETING INTERESTS

The author has no relevant financial or non-financial interests to disclose.

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