



MODERN TRENDS IN CALENDAR PRODUCTION

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Abstract. *The article analyzes current trends in the design and production of contemporary printed calendar products. It examines innovative approaches to calendar construction, including transformable, modular, and interactive formats utilizing augmented reality (AR) technologies and 3D printing. Particular attention is paid to the growing interest in environmentally friendly materials and the integration of digital interfaces, including artificial intelligence-based calendar systems. Through the application of advanced finishing techniques, modern calendars successfully combine aesthetic value, functional versatility, and tactile appeal.*

In the production of modern calendars, approaches to structural and visual design are undergoing significant transformation. Calendars are evolving beyond their traditional utilitarian role of tracking dates, becoming objects of visual culture, elements of personal branding, and decorative design. High-quality design and binding are no longer sufficient; instead, unique calendar constructions emerge at the intersection of design, printing technologies, and digital interfaces. These innovations incorporate creative content while addressing ecological considerations in production. Creative approaches to form, materials, and functionality enable the creation of both practical and aesthetically or interactively engaging objects.

Research in this area primarily focuses on modern constructions, materials, and technologies in the context of innovation, functionality, ergonomics, and sustainability.

1. Eco-friendly materials. Recent developments involve the use of innovative paper types made from sustainable sources, such as recycled paper, cotton paper, coffee and tea waste fibers, banana fiber paper, and others. A notable example is seed paper – made from recycled cotton waste and embedded with seeds – which can be planted in soil after use, providing an aesthetically pleasing and sustainable recycling method [1]. Such calendars often feature minimalist design, natural colors, and textured finishes.

2. AR integration. The implementation of augmented reality (AR) technologies in calendar production is expanding. AR allows users to interact with printed elements via mobile applications, adding dynamic visuals or extended functionality. For instance, the animation design studio We Are Royale developed an AR-enhanced calendar using Unity, Maya, Adobe After Effects, Spline, Adobe Flash, and Qualcomm's Vuforia, enabling markerless AR tracking. Each month features a unique interactive model, ranging from simple touch responses to mini-games (e.g., virtual baseball) [2].

3. Some calendars are integrated with additional functions, such as organizers or items that transform into useful everyday objects (e.g., pen holders, key stands, lamps). These are often made from wood, plastic, or metal and serve as functional art objects. Users can rearrange movable elements to suit their needs, increasing the



product's versatility. Examples include perpetual calendars with wooden blocks or other structural forms, and tear-off 3D calendars in the shape of trees, animals, or illuminated architectural models, such as the TimePiece Calendar.

4. Technological innovations. 3D printing technologies facilitate the creation of conceptually and visually unique calendars – such as Aztec "Sun Stone" calendars, Mayan calendars illustrating both ritual and solar cycles (Tzolk'in and Haab'), or steampunk-inspired models. These designs integrate mechanical elements (gears, springs) and are fully realized using additive manufacturing methods [3].

5. Expanding functionality and tactile appeal. A key trend is the development of transformer-style designs, including calendars in book format with fold-outs or pop-up elements. Three-dimensional shapes (e.g., pyramids, cubes, cylinders) enhance the user experience by encouraging physical interaction. At the same time, printing technologies that enhance tactile perception – such as selective and soft-touch varnishing, flocking, die-cutting, and embossing – are increasingly applied in calendar production.

6. Personalization. One of the key areas of development is the advancement of digital printing technologies, which enable the rapid and high-quality production of calendars with personalized elements. Important advantages include the ability to print in small runs, maintain high image quality, and ensure cost-effectiveness. The use of UV inkjet printing in calendar production makes it possible to implement personalization and achieve appealing tactile effects on a variety of substrates.

In recent years, creative Advent calendars (originating in 19th-century Germany) have grown in popularity. These address diverse consumer interests, including chocolate, tea, cosmetics, coffee, and wish-based themes [4]. Digital formats also exist, such as interactive Advent calendars for language learning.

Electronic calendars remain in high demand due to their accessibility and integration across digital platforms. The use of neural networks in calendar applications is gaining relevance. AI-based systems can forecast events, automate scheduling, suggest optimal timing, and enhance user experience through personalized notifications and solutions. For example, AI Calendar Maker enables users to design custom calendars with AI tools, including the ability to set brand colors, fonts, logos, and more within its "Brandbooks" feature [5].

The application of advanced printing technologies – such as die-cutting, embossing, flocking, digital printing, and AR – is contributing to a new generation of calendar products: aesthetically refined, functionally adaptive, and emotionally engaging.

References

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