



Smart Guide

Intelligent Algorithms in Photo Products Sector

Printbox

Introduction

After successful digitization, the photographic services market has entered a new decade. Smart innovations, which can attract additional target groups, would be the key drivers of growth.

At Printbox, we are inspired by all the big challenges in photography and storytelling. This is why we would like to introduce you to our approach to technological innovation, Machine Learning, and smart algorithms that can be used to create the next generation of photo printing solutions and personalized photo products.

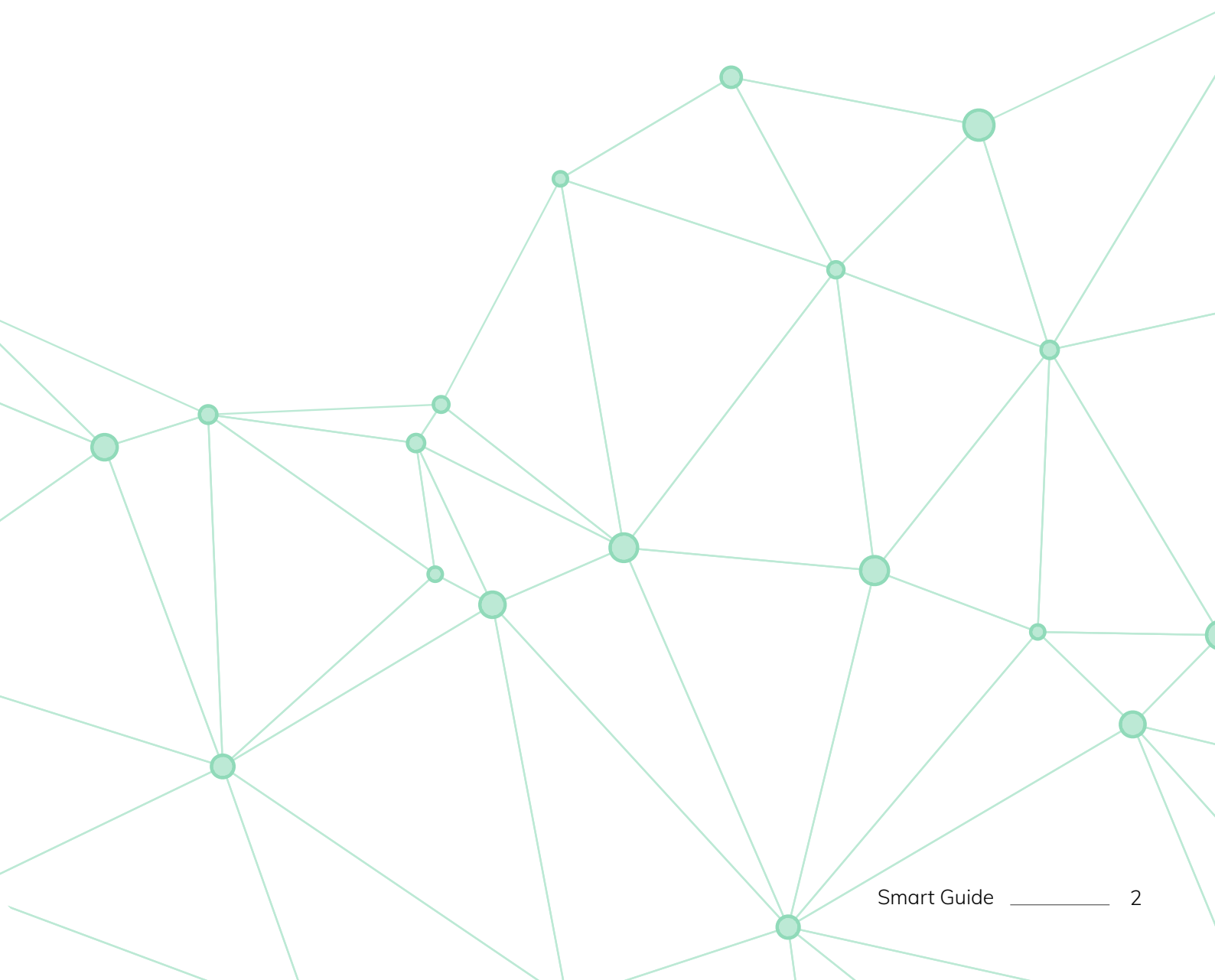


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I Market Overview

1. Photo products sector in full swing

Futuresource, a consumer electronics consulting company, forecasts a **10% increase in value across the entire photo, photo books, and photo printing industry to 2024**, led by a 4.5% annual increase in sales of photo merchandise*. In the last decade, 8.6 trillion photos were taken, of which over 1 trillion in 2020 only! Interestingly, **merely 5% of them have been printed****.

According to Market Research Future, the **global photo printing market is expected to reach over 26 billion USD**, including:

- Photo Products Market – 17,9 billion USD.
- Web to Print Market – 1 billion USD.***

Photo Products Market



Web to Print



* <https://printbusiness.co.uk/photo-books-boosted-by-pandemic-effects/>

** Rise above research

*** Global-print.org

I Market Overview

2. The emergence of new users

2.1. Enjoyable experience for Millennials and Gen Z

Even though the world is becoming more and more digital, photo printing is experiencing a renaissance. Ironically, it is directly related to the fact that Millennials and Gen Z are digital natives.

They perceive print as something fresh, interesting and appreciate its ability to commemorate their lives - even in the age of social media trends. A study by Futuresource found that **Millennials are the most likely age group to physically print the photos – their share is as high as 61%***.

Importantly, Millennials are also the largest generation of the workforce – **the people who cannot and do not want to spend too much time on tedious activities** daily. They decide to choose services that are hassle-free, smooth, and simple – also when it comes to printing photos.

As the effectiveness of digital marketing continues to improve with the **increasing use of smartphones and online shopping** among Millennials & Gen Z, consumers in different parts of the world are becoming aware of the various photo printing services.

* <https://direporter.com/industry-news/market-research-industry-news/millennials-printing-photos-future-source>

I Market Overview

2. The emergence of new users

2.2. Long-term effects of a pandemic lockdown

A new type of user also emerged during **the 2020 photo product boom, triggered by the pandemic**. The tendency to order personalized photo books more often at this time is explained by the circumstances of the lockdown, as COVID-19 has caused changes in all areas of human life, including the printing:

- People had more time to organize the images of their previous journeys and ordered more photo books.
- Online shopping has increased in value like never before.
- Home isolation resulted in the desire to search for new forms of entertainment and spending free time.

Although the restrictions in particular countries are slowly loosening, **the human passion for creating personal photo albums has remained**. For example, at Printbox, we observe a tendency to increase interest in our customers' offers in periods when the weather is bad and rainy.

Market example

Popsa, one of the photo book delivery companies that use automated personalization, powered by Machine Learning, achieved a 10.576% increase last year, which was awarded by Deloitte in the Fast 50 ranking. The pandemic did not negatively affect the company, on the contrary – it recorded outstanding financial results.*

Such a growing trend in the global e-commerce sector is expected to expand the consumer base with an interest in photo printing services and personalized photo products.

* <http://www.deloitte.co.uk/fast50/winners/2020/winner-profiles/popsa/>

II Why are smart technologies worth considering in the printing industry?

1. Weaknesses of the traditional approach to creating photo books

As we mentioned in the previous chapter, people choose to print only a small percentage of the photos they take. **What is the reason for this?**

The traditional approach to generating a photo book requires a lot of manual and time-consuming operations.

Our internal analysis shows that **47% of projects are not completed and are abandoned without purchasing***. It may mean losing a huge amount of money and a lot of potentially satisfied customers!



47% of projects are not completed and are abandoned without purchasing*

However, even more importantly, it is also a matter of losing a large market share of **people who dropped out of the service before even starting the project**. Initial discouragement, caused by concerns about the necessity to devote a lot of time to the selection of several dozen out of hundreds of photos, significantly reduces the number of orders.

* Analysis of the average results of Printbox customers in terms of photo books, January-December, 2020.

II Why are smart technologies worth considering in the printing industry?

The era of digital photography has changed behaviors around photo printing and archiving of pictures. The development of smartphones in recent years has resulted in many voices from users saying they want to create photo albums from the pictures they have taken, but **it is protracted and cumbersome to select images and plan the layout.**

For those who order prints of their photos, **it may take several weeks to organize and arrange hundreds of digital images** that have been taken. In most cases, customers abandon the project due to the laborious process and lack of time.

54.51% of photo books are created and ordered on the same day, and for 70% of all purchased projects, the transaction is concluded within 4 days of their creation*. Offering services that require a more time-consuming process simply takes away the chance to make a big sale.



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We all know life is fast and busy, but **that shouldn't mean compromising**. As a photo products service provider facing market competition, companies need to provide professional quality without any unnecessary effort on the part of the user.

* Analysis conducted in 2020 based on data provided by Printbox customers.

II Why are smart technologies worth considering in the printing industry?

2. What does smart tech mean in the printing industry?

The goal of any business is to get the client to take the step from start to purchase as quickly and efficiently as possible.

As a photo product software provider, we identified **three main categories of challenges that smart technology can respond to:**

- how to simplify for the user the process of selecting photos to be used in the project
- how to make the product designing process more attractive and offer various alternative versions and ideas
- how to arrange photos aesthetically to ensure a beautiful end-product.

Thanks to the use of **smart technologies in the printing industry**, the customers can successfully reach this objective within minutes.

II Why are smart technologies worth considering in the printing industry?

2. What does smart tech mean in the printing industry?

2.1. Why Artificial Intelligence can be the future of selling photo books?

AI in personalized printing is still a hot topic - both at the software and hardware levels. It is a catch-all term that describes several interrelated software solutions:



Neural Networks, which are computing platforms that mimic the tangle of neurons in the human brain to process large sets of data.



Machine Learning, which is an iterative process, making it easier for applications to perform the necessary preparatory work.



Machine Vision, i.e. the ability of the software to identify the content of the image.

It relates to several areas of practical application:



Image classification – algorithms create a list of categories of objects present in the image.



Single-object location – algorithms indicate the location and scale of one instance of each object category.



Object detection – algorithms indicate the position and scale of each occurrence of each object category.

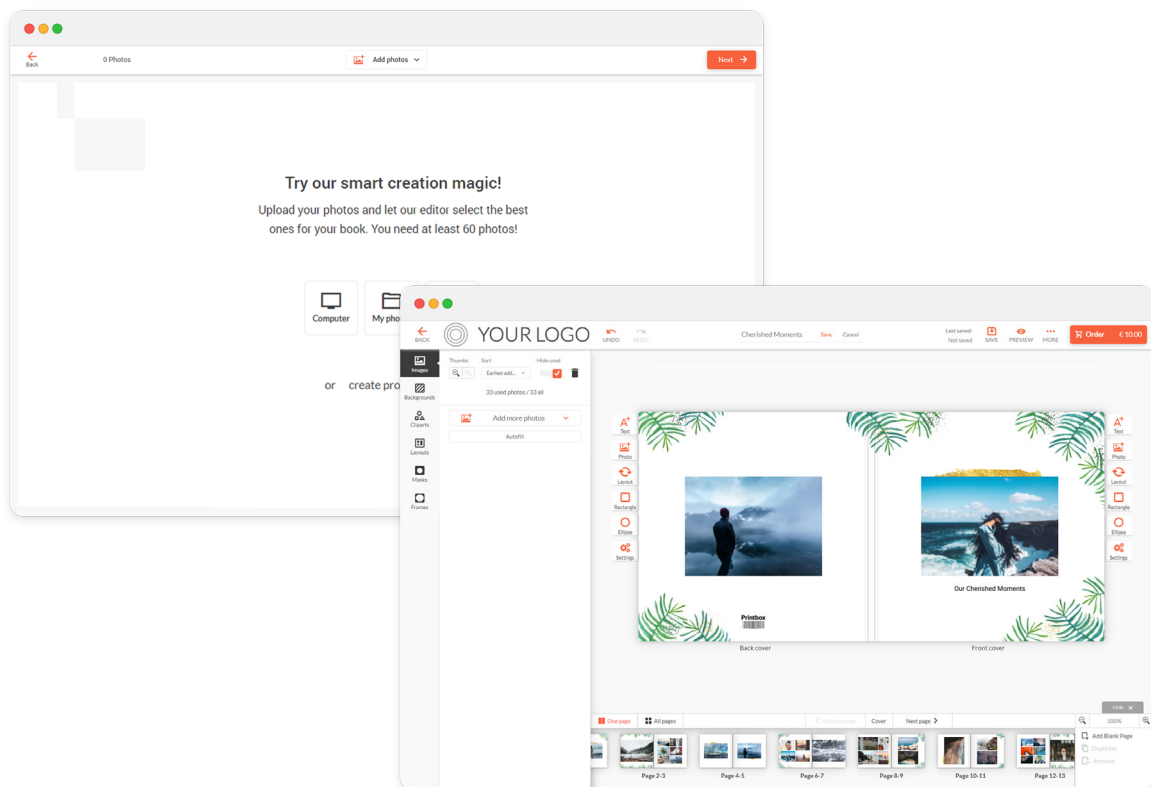
Together, these AI technologies have been released across industries, and photo products are no exception. Smart technologies revolutionize the printing market and transforms image printing from **do-it-yourself** to **do-it-for-me** approach.

II Why are smart technologies worth considering in the printing industry?

2. What does smart tech mean in the printing industry?


2.2. The story behind the Printbox Smart Creation

The data we analyzed while working with our clients encouraged us to take up the challenge. Our goal was to minimize the burden on users when creating stylish photo books and to do this with as little effort as possible on the part of Printbox customers.



II Why are smart technologies worth considering in the printing industry?


This is how it works:

 Users can upload as many photos as they want. Smart Creation analyzes all the pictures, clusters & rates them, and finally selects the best ones to create a complete story.


What is clustering and how it works?


When using a set of photos to automatically create a photo book you need to divide that set into meaningful groups. Those groups, layed out on consecutive spreads, will tell the story. The number of clusters or their sizes may be influenced by user preferences, but if you get the clusterization right, the book starts to tell the story by itself.

Kasper Rybak, Product Owner @ Printbox

 For the analysis of the photos, Printbox uses Artificial Intelligence solutions in TensorFlow with various Convolutional & Siamese Neural Networks, paired with classical image processing algorithms.

The algorithms included in Smart Creation analyze the subject of the photo by categorizing it and detect objects related to the topic of a photo – their positions and sizes.

 The solution may take more input from the user (desired number of pages, or photo density) otherwise may work more independently, deciding what's the best for the user.

 Then the Smart Creation selects the appropriate complementary elements, such as frames or layout design, to create stunning pages that match the overall theme style chosen by the user.

As a result, **the user is offered a ready-made photo book in just a few moments.** Importantly, **users can make changes** as they see fit to combine both worlds, automation and manual customization, to create **a fully personalized design.**

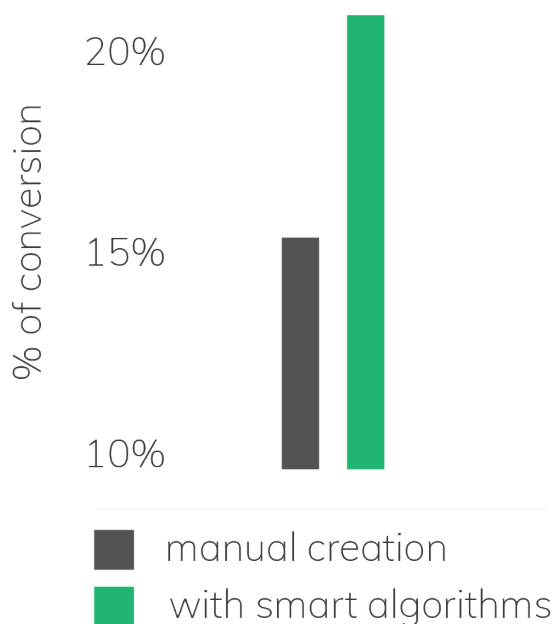
III Results from Smart Creation live tests

After starting the implementation of our Smart Creation solution, all clients involved in the process, who applied the standard path we proposed, began to notice that the use of algorithms results in a higher conversion than in the case of manual project creation.

To investigate the essence of the phenomenon, we decided to conduct live tests with two of the largest clients. First, we have implemented test versions in their environments, including Smart Creation solutions. Next, we monitored users' behavior, recorded the received data, and came up with several useful observations. The analyzes were conducted from February to May 2021.

Live tests allowed us to obtain interesting statistics and conclusions:

1. The use of Smart Creation by one of our clients increased the conversion from 15.74% (the result achieved with the manual creation of projects) to 20.92% (when customers use smart algorithms).*



The conversion is understood as the number of ordered (and paid) end-products, out of the number of projects created at the selected time:

- using Smart Creation
- without the use of Smart Creation – projects for which the Smart option was available, but the user decided to make the book manually.

* Analysis of data from tests of creation and sale of photo books conducted from February to May 2021.

III Results from Smart Creation live tests

Importantly, the comparison considers the number of projects, not the number of users. This means that one user could do more than one project, of which only one was ordered. That is why the recorded conversion may be lower, although more users finally ordered the product.

2. In the environment of another client, where the research sample was slightly smaller, 11.5% of users decided to use Smart Creation. However, **the conversion on this path was as high as 17.5%**, which was **several times higher than the result achieved in the standard path**.

This analysis pays particular attention to the role of **appropriate customer journey's design** while using intelligent technologies. When deciding to introduce algorithm-driven editors, you need to properly communicate the benefits of the automation process and explain what the customer can expect in the next steps.

3. Moreover, we have noticed significantly improved results in reducing the time spent on creating a project – **the average time to prepare a photo book using Smart Creation is reduced by over 40,2% to 50,3%**, comparing to creating a project manually.



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III Results from Smart Creation live tests

- 4. During the tests, we noticed that nearly 65% of the projects with Smart Creation algorithms were completed in less than 45 minutes, while for manual projects the time was 61 minutes on average.



Smart Creation is the proprietary mechanism that we have created to **make photo book creation as simple as possible** for most non-professionals. Therefore, the measure of our success is the increase in conversion compared to the manual creation of photo books, as well as the reduction of their creation time.

Conducting tests allows us to determine the correctness of the clustering algorithm, or to help our clients match the most optimal user path.

VI Practical aspects of AI applications in business

1. The needs of a new audience that can be met with AI

Companies providing photo printing services want to adapt to the needs of non-professional users, which means:

- dealing with amateur photos, sometimes blurry or quality inconsistent
- lack of users' willingness to spend a lot of time creating a project
- their desire to receive a great-looking end-product as soon as possible.

Smart technologies, Artificial Intelligence, as well as its branches, can bring tangible benefits in these areas, as you can provide your customers with very fast creation of attractive designs and layouts, considering their tastes and various product styles.

VI Practical aspects of AI applications in business

Best pictures selection

One of the significant inconveniences that people face when creating photo books is the selection of photos. Typically, the user has dozens to choose from.

Machine Learning and **basic computer vision** can be a remedy for this challenge. It will analyze the customer's photos and find patterns to come up with suggestions for the best selection of images but also evaluate their quality to create a composition that will look the best when printed.

Composing a coherent story

The greatest photo books tell specific stories. They consist of particular sets of photos that can be displayed in different configurations, presenting various plot perspectives.

Creating complex and professional-looking photo products still requires design and composition skills to achieve truly eye-pleasing results. Nevertheless, many users simply lack such skills.

Instead, companies can offer tools that allow the user to **automatically apply a design and composition**. This kind of technology can take care of photo selection, cropping, grouping, layouts & decoration to significantly accelerate the process of creating the final product.

The ability to quickly create different variants

Our analyzes show that **every fifth user prepares several versions of the photo book design and selects one to buy from the available variants.**

Therefore, in addition to automating the creation of projects, smart tools can offer a variety of templates, themes, frames & backgrounds to satisfy users and help them choose a pattern for every occasion.

VI Practical aspects of AI applications in business

2. Practical tips for implementing and using intelligent solutions

When choosing a software vendor and implementing smart technology in your company, remember 3 important rules:

- **Provide the possibility of editing the design elements, even after the smart tech proposes a final product.** This will give the user a sense of greater control over the look of the product. You don't have to worry that this will extend the period of work on the project. The use of the algorithms will shorten the creation time anyway, and thus increase the chances of finalizing the order.
- **Don't forget about the RWD.** Make sure that the appearance, layout, and content of the editor are automatically adjusted to the screen size of the device. Thanks to this, you will be able to deliver your offer to more users, achieve higher positions in Google searches and appreciate the simplicity of website management.
- Make sure you **offer the proper templates.** Themes and layout proposals that you propose to end-users should be optimal to the requirements of smart solutions. Contact the provider of the chosen service and ask about the appropriate parameters.

Customization and personalization are the “name of the game” in digital marketing nowadays. For this reason, intelligent technology can be an important communication resource that marketers should consider.

Therefore, take care of the correct **promotion and highlight the smart technology directly on your website.** The user should be aware at the very beginning of their journey that they have a chance to take advantage of options that significantly facilitate their work. The choice of the shopping path should be clear so that the customer is aware of the steps that follow.

Moreover, consider starting **dedicated marketing campaigns, both in Google Ads and on social media.** Results achieved by our customers participating in the aforementioned tests tell us that this is a great way to **reach new customers – smart technologies encourage users to buy photo books more spontaneously.**

Conclusions: How to start with the Smart

However, investing in in-house research and an AI development team is a very large investment, requiring a lot of money. **Hence, start by looking for a software provider.**

Smart solutions are characterized by high profitability. At the same time, you must remember that the tools you offer should be flexible enough so that users can easily reorganize and recompose their pages to best suit their needs.

At [Printbox](#), we always encourage companies to conduct tests within one instance, which will allow them to become familiar with the technology and understand its principles of operation. Even if you are not our customer, you can try our Smart path within your existing store, the last stage of which is our editor.

The speed and ease of creating photo products is an unquestionable competitive advantage in this industry. If you can offer your customers an attractive result in just a few clicks, then you can become a real love brand.

Don't hesitate and try our [demo](#) or [contact our sales team](#).