

INTERGRAF

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How does artificial intelligence affect the print industry, and what are the associated risks and opportunities?

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# Artificial Intelligence... Who?

First of all, we need to understand the meaning of artificial intelligence, and it's not as complicated as you might think...

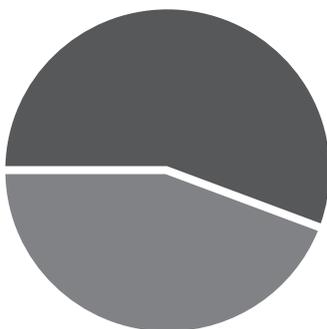
In short, Artificial Intelligence (AI) is the area of science that seeks to both create and develop computers and machines capable of thinking, learning and acting in ways that would normally require human intelligence.

If we take advantage of it, AI can significantly improve all areas in which it operates. Nowadays, this concept is worrying many people in the print industry... perhaps it's because human beings are afraid of the unknown.

*Artificial intelligence is gaining ground in many areas, but is it good for the print industry?*

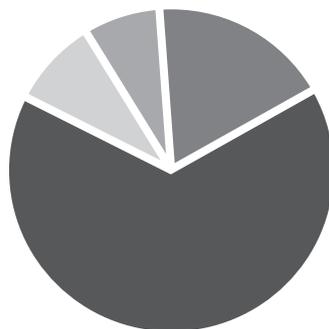
Before answering, I asked 3 questions to people involved in the printing industry:

## 1. THE ARTIFICIAL INTELLIGENCE IN THE PRINT INDUSTRY IT'S...



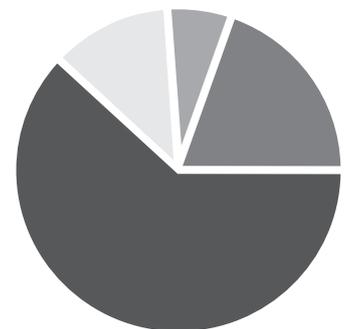
- A VALUE
- A THREAT

## 2. CURRENTLY, WHAT IS THE BIGGEST CAUSE FOR CONCERN WHEN IT COMES TO IMPLEMENTING AI IN PRINT INDUSTRY?



- FUNCTION AUTOMATION AND LOSS OF JOBS
- LACK OF SECURITY REGARDING TO DATA PROTECTION
- HIGH COSTS IN PURCHASING HARDWARE AND SOFTWARE
- LACK OF PROFESSIONALS SPECIALIZED IN AI

## 3. WHERE DOES AI STAND OUT THE MOST?



- COLLABORATION IN THE CREATIVE PROCESS
- PRE-PRESS: QUALITY CONTROL AUTOMATED, AUTOMATIC IMPOSITION
- PRODUCTION MANAGEMENT: SCHEDULING MACHINES / STAGES
- FACILITATION OF EXHAUSTING PROCESSES AND COPYWRITING

# Artificial Intelligence + The Creative Process

Every project, either packaging, editorial, books or even car decoration, has gone through the creative process.

It makes perfect sense to start this connection between artificial intelligence and the world of graphics from the beginning...

AI offers ways to make a designer's life much easier.

At the beginning of the creative process, it's possible to quickly analyze data that provides keys to inspiration, reducing research time at this stage.

Lack of inspiration is a well-known problem among designers. AI can help providing suggestions and stimulating both mind and imagination.

When it comes to the final artwork, AI is a lifesaver. Adding pixels to improve the quality of the image or obtaining a good bleed margin for printing are a few examples.

Artificial intelligence is also causing virtual reality to make significant strides

and change the experience of creating.

Augmented Reality (AR) allow new interactive experiences between the printed object and the digital support, providing a multi-platform experience for the user. For example, a printed book could have an illustrative video; or in the object's packaging you could see a tutorial of how to use it, using an AR device. I believe this will also be an asset for inclusion.

With all these examples, the designer can focus on creativity and design concept, saving time and...

... time is money.

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## BUT IS IT ALL GOOD?

*Although AI is an added value for the designer, there are some points to be considered.*

### IDEA

Before the products reached the final stage, graphic production, they had to be created. Before that, they need to be idealized. That's where we have the first difference: AI can be an asset in the creative process, but the starting point will always be an idea which, in turn, comes from the human mind.

### CREATIVITY CAN'T HAVE LIMITS

AI comes from a database which, like any other system, is limited. On the other hand, human creativity has no limits or obstacles, and the capacity for innovation is based on this principle.

If there is a limit, ideas are limited too.

In my opinion, it's not possible for AI to think "outside the box" as there is no "outside the box".

## VULNERABILITY

Regardless of technological evolution, there are flaws. If designers rely solely on AI, they won't be able to resolve the situation in the event of a technical error.

Failures and lack of security in data protection are also issues that concern most people.

## Balance is the key...

We must see AI as an ally and inexhaustible source of inspiration, not as a threat or substitute. We need to find a balance between efficient automation / innovation and creativity as a human mind.

We must be critical and open minded about the ethical and aesthetic limits of collaboration between human creativity and AI.

## Artificial Intelligence + The Print Industry

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We have already seen that AI is a positive point for design if used smartly, but does it have the same impact in the print industry?

### OPTIMIZING PRE-PRESS

Before a job proceeds to production, it goes through a number of processes known as pre-press. Over there, a thorough analysis and checking of files is made to guarantee that there are no flaws either printing or finishing. With AI, file quality control is faster and more efficient. It is possible to analyze files 99% perfectly, detecting and preventing errors that would only be detected at the printing stage or even after production.

This is being the case of overprints, wrong color selection, alignment errors and other irregularities, which are often detected at the "end of the line".

## ETHICS & ESSENCE

No one knows if one day it will be possible. Nevertheless, for now we can be sure that human intuition will only be present in human beings.

Using AI as the only ally for creating a project is a risk, since it can result in an ethically and culturally incorrect design.

Each designer has their own essence, style and characteristic. If designers start relying only on AI, those attributes will cease to exist.

### PRODUCTION OPTIMIZATION

AI goes hand in hand with efficiency.

Machine / stage programming and intelligent production management allows for a more efficient response.

With AI, problems can be corrected in real time.

How great would it be if AI could detect color variations during the print process and automatically adapt the color percentages? Or even make format tuning an automatic process?

What seems impossible today could be the future.

## MACHINE PROBLEM DETECTION

Rapid detection of machine breakdowns is necessary to identify the problem and resolve it as soon as possible. AI can do more: it can analyze wear and tear in parallel with the machine's production history, predicting possible breakdowns.

Many components are specific, increasing downtime and consequent delays in production, in case of machine damage.

If maintenance is carried out according to the analysis made by AI, machines will always be functional based on their real needs, thus avoiding unnecessary expenses and the premature replacement of it.

## STOCK MANAGEMENT

It is possible to predict market supply by analyzing and studying the market in previous years. In this way, stocks can be prevented and production managed effectively, relying on this forecast.

## STEP BY STEP

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As AI is a new world, the investment is very expensive. The costs of acquiring advanced hardware or software and hiring specialized professionals in the branch are quite high. Furthermore, there aren't a lot of professionals prepared to use AI systems, which leads to a great deal of resistance to change.

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Automating production processes means devaluing human work, which makes workers afraid of losing their jobs. The truth is that there will inevitably be fewer job opportunities in the future. It's been like that since the industrial revolution, direct consequence of each step that technology takes. Relying only on AI is not an intelligent strategy because, as a machine, there can be unpredictable errors and technical failures may occur.

## The Future of Printing

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In a world that is constantly moving forward, we are going to witness something that is already revolutionary: Artificial Intelligence.

## GREENER

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We start with one of the most important topics nowadays: sustainability. In addition to designers prioritizing sustainable design / eco design during the creative process, the graphic industry is looking for more sustainable methods, like ecological inks and consumables or printing processes with lower energy consumption.

By optimizing the use of energy, AI reduces costs and environmental footprint.

Recycling is a process that can be improved through AI. New raw materials and new ways of recycling waste from the print industries may also be discovered and developed.

Nowadays, environmental responsibility is a duty for everyone. AI approaches this topic in a positive way. However, it's important to be aware of carbon footprint associated with the production of AI hardware and make a balance between technological innovation and environmental responsibility, in the best way possible.

## MORE OPTIMIZED AND EFFICIENT

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Optimization is the most sought after feature by all businesses. In a world where they want everything for yesterday, AI facilitates responsiveness.

I believe that at some point, AI will be integrated into the most stages of printing process. Initially, it will be very useful during the pre-press process, namely in design, file analysis and resource management, for example. Afterwards, AI will be present in robotic automation to control the quality of the final product. From my perspective, will only be study AI in the stages of printing and material handling, because it will lead to a significant reduction in the need of human intervention: one of the biggest reasons to see artificial intelligence as a threat. In addition, graphic production is an area related to art, and art also depends on human intuition, which is not reproducible by AI.

## SMARTER

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Mass customization, combined with AI, allows you to produce only what is needed in a personalized way, responding to consumer's individual needs and reducing waste. Currently, customization is the main reason why 3D printing is experiencing notable growth in the print industry. In addition to prototyping, it is possible to produce customized parts for areas like medicine ( e.g. prosthetics) and mechanics (e.g. car parts).

*What is necessary is produced efficiently.*

## MORE TECHNOLOGICAL

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In the future, AI will allow you to effectively connect the entire *supplier - customer* chain, offering a quick response with personalized service and ensuring the correct acquisition of consumables and raw materials according to market needs.

Online platforms, such as websites and apps will be more common. In this aspect, User Interface (UI) and User Experience (UX) design are going to play a fundamental role.

## Conclusion

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AI has arrived and is here to stay. We live with it daily through our cell phones, cars and even homes. It's up to the print industry to take advantage of AI, adapting to a world that is constantly progressing by investing in automated systems, which are connected with online platforms. It's important to realize that this arrival goes hand in hand with technological innovation, bringing with it personalization, efficiency, quality and awareness.

Despite all the positive progress, we should take into account the challenges that still arise like security, privacy and ethics. We need to educate the industry about AI and it is urgent to provide training and continue researching.

Anyway, in my point of view, AI will never be independent in the graphic industry. Graphic arts are a form of art, which requires intuition and human essence.

AI is limited as it is created by human being. AI innovation stops when human innovation ceases. The future is depending on the wisdom of balancing AI with human intelligence. Not struggling to see which is better, but bringing them together to make print industry stronger.