The Future of Printing:

a Gen Zer's view

The present text was exclusively written by me for
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"How will print develop in the future?"

Introduction

The future is digital. Some people may continue to be reluctant to the future's developments, which is totally understandable as most common human beings are too busy to be able to accompany such innovations. However, everyone — even those who were already born in the digital era — perceives the huge changes acquired through this century. And it has only been twenty one years. Thus, if we look into the future it becomes hard, even naive, to deny that first statement.

It is irrefutable that the world will face big changes in the next few years. Robotics, the Internet of Things, Big Data, Machine Learning, Artificial Intelligence (AI), Virtual Reality (VR), Augmented Reality (AR), 3D Printing are some concepts that will be, and already are, at the centre of such tangible transformations.

The industry already overcame big challenges in the past century and now is seeing an evident decline on the production of some of its traditional goods. The industry's main sectors, advertising and publishing, are moving towards digital displays as they offer a wide range of amazing possibilities that paper does not. Catalogs, manuals, newspapers, stationery, etc., are already becoming obsolete objects. Whether this is sad or not depends on the perspective. The industry must look at technology as an opportunity rather than an enemy, so it can effectively change.

I think that the death of print is still a far-off concern. Printed materials will, as far as I can see, be needed for packaging, signage, banners, billboards, labels, books, etc. Also, physical formats will, even in our generations, be valued[1]. Nevertheless, in order to compensate for its evident loss, the print industry needs to make big changes in its full spectrum.

No one can really predict the future. Therefore, instead of trying to do it, I will mostly look at where I think the industry has opportunities to change and grow in order to attract young people and to be up-to-date. To do so, I organized my thoughts in four different categories: production and products, selling, communication and values.

Production/ Products

The digital world offer great opportunities. Even though there is a great awareness by the industry on this matter, there don't seem to exist many high-tech opportunities. Most factories are still a lot traditional, therefore are not looking for a new skilled workforce. Young people do not look for traditional workplaces so the industry must accelerate its digitalization process. Factories have to find its opportunities in a ever changing world and acknowledge some of the current trends and prospect.

In the future everything is undeniably going to become more robotic and automatized[2]. It is possible that factories will work on their own and machines will no longer need human supervision (just like Amazon's warehouses). Becoming more automatized means faster production and cheaper products which is great. Unfortunately, many small factories will lack the opportunities and money to change, adapt and compete. The ones that will be able to make an investment in robotics will definitely excel. It may happen that it will be

[1] Presently, we are seeing a sort of analogue renascence. Even though we are digital natives we are choosing analogue formats such as vinyl, cassette, analogue photography, etc. I find this really interesting. I think these formats offer us some novelty or what is called Anemoia — that nostalgic feeling of a past you never lived. It proves that physical formats will not be death, quite the contrary.

[2] I feel like this is a sensitive topic that people usually tend to fear. Robots will steal jobs and replace humans. In my opinion, that is reasonable and desirable when it comes to monotonous boring tasks. In fact, I wished I had more and better robots in the factory I currently work so I wouldn't have to spend days doing the same finishing work.

cheaper to order works from China than to order from the printing shop in our own living city because this one will still be paying wages to its employees.

Most printing factories are still a lot limited to traditional printed paper materials. Probably, all the industry should start offering services of 3D printing, laser cut, FormBox, CNC (Computer Numerical Control), as they offer endless opportunities, and utilize other materials such as wood, glass, ceramics, plastics, etc.. These techniques are already becoming more popular among clients and companies, especially among young people.

As I already said, I do not think printed paper will turn obsolete soon. Instead, it will merge with digital environments through augmented reality (AR). You will point your phone's camera to a printed support and it will gain within your screen. I can imagine this happening with most printed objects, from a business card to book covers with hidden messages; from a kid's book to a street advertisement. This is a huge opportunity as it is way less expensive than a screen and it can offer viewers a similar experience.

An app that offers interaction from a physical material through augmented reality. For the first time, physical formats offer users what only digital formats could.

AI and data are being used to develop online customised adverts, based on each individual likes and behaviours. The print industry could benefit from the same tools. Marley Niesz (2020) writes that "with our inkjet printer and your data, CCG can print and send a self-mailer to a consumer with the exact jacket they had in their online shopping cart two days earlier. Imagine the power this holds." In my opinion, this example entails significant privacy problems, but there are great possibilities here. The industry could provide unique pieces to consumers based on their own choices, in transparent ways.

Imagine you are a subscriber of some magazine; you do not really care about sports or fashion, you only like to read about travelling and politics, you could receive a magazine exclusively made to you based on your own choices. In the same article, Marley Niesz, points out that "people are a lot less likely to throw something out if it's made exactly for them" and I couldn't agree more. Fortunately, digital printing can easily print different things without so much waste. And, if you are thinking that it would be a lot of work for the designer to make a different magazine to each client, relax, AI and generative design will make it by themselves, with a lot less possible errors.

I just pointed out a few examples. There are, of course, a lot more opportunities available in this digital world[3]. The most important thing is to keep up with new technologies. Only by acknowledging them it is possible, step by step, to start embracing them with no fear.

[3] Per example, UI/UX designer, 3D designer, web and app developer; e-books production, digital marketing, functional printing, etc.

Selling

The way the print industry sells is, at least, ancient. Clients have to go there, explain what they want, go back home, exchange emails with proofs, exchange emails with costs, go there again... And sometimes, mistakes happen. Money wasted. What a hassle.

Many companies, in the most varied fields, are finding ways to enhance its sales using online and digital opportunities. In 2019 Ikea's online trade rose by 45% "thanks in large part to its offering to customers of ever more options to create their home spaces digitally, especially using augmented reality to project images of furniture on to the walls of their homes." (Connolly, 2020)

The purpose of e-commerce is to facilitate consumers' lives by minimizing the steps needed to purchase a good. It is being used by clothing stores, furniture stores, supermarkets, restaurants, basically by every sector that involves selling. The techniques are becoming more optimised at each passing day. Well, Ikea is using AR to sell furniture and offer the best convenience to its clients, why is the print industry tied to such archaic trade? I can imagine some start-up finding a way to give customers the opportunity to do a print purchase having to leave the couch. I cannot exactly predict how, but I have a small suggestion.

So, suppose you are a client. I am picturing an app where you could download the work you want to print, either you download it with the correct size or, if you are lazy, you choose the size directly in the app as it would automatically adjust; you would choose the material you would like to print in; you would choose the quantity; which print technique you would like to print in, whether offset, screen printing, digital printing, etc.; while you are making these decisions the app would even be giving you suggestions on which option would be the best quality, the cheapest, fastest or more ecological. Great! After all those decisions finished, the app would generate a 360º hyper-realistic 3D render of your work, as a digital proof. If you did not like the result you could go back and choose another print technique or a different paper. Then you would have your delivery at home by drones. Ok, maybe drones are too bold, for now.

You may think this is utopian. While digital mock-ups are getting a lot realistic, it would never be the same as a physical mock-up because it does not give you a sense of touch. Well, you are wrong. From the Wunderman Thompson Intelligence annual report *The Future 100: 2020* (2020), in the regard of haptic technology, we can establish that "Gone are the days when potential buyers had to imagine how a product might feel [...]. The ability to simulate texture and fabric on smartphones and tablets is a breakthrough for online shopping, connecting the physical and digital worlds" (pp.47-48).

As a graphic designer I would absolutely love and benefit from an app like this. First, we would be the ones making the ultimate decisions, thus mistakes would be less likely. Secondly, we would become more familiarized with different print techniques and possibilities[4] as well as be able to try everything without wasting any paper or offset plates. Besides, I strongly believe that something like this would extend the print industry public. As Christiane Herman (2021) notes in *Online Printing Trends to Embrace in 2021* "the stereotypical print customer of the past decades that buys big, for an entire company or a big print campaign, doesn't exist anymore". Due to its easiness, an app like this would attract many clients with personal and experimental works, most likely, young people.

[4] Unfortunately, a lot of mistakes happen because many graphic designers lack technical knowledge.

Of course this idea is nothing but my imagination exploring possibilities. Yet, I deeply believe that ideas are not exclusive to anyone, so, one day, someone will ask the same questions I asked — how to bring press directly to our digital devices and how to reduce the steps of purchasing a printed work. I do not know if something similar will ever happen, but if it does, it will have an huge impact in the industry, especially if it is run by some american start-up striving to monopolize markets. Just look at what Uber did to taxis, what Airbnb did to accommodation, what Amazon did to small markets. To think about these (not so) radical possibilities is to be prepared for what might come. Remember, customers will always look for what offers the cheapest service and the best convenience.

In any case, the path to follow is definitely online trade. In the same drupa's article, Christiane Hermann notes that "especially important when it comes to B2C, a mobile support becomes exceedingly important. Printers who have gotten into this trend early on note a significant growth..."

Communication

Most print factories still rely on mouth to mouth promotion. The print factory I work for does not even have a website. The internet is the first and the most reliable way of communication among youth. It is a decisive factor whether we will trust you or we will not.

To have a website and social media is now imperative for any print factory, but even more for an European Federation as Intergraf. Having an online presence can guarantee a disclosure to the European industry as well as give voice to its smaller members. However, a website is not enough. To meet us is crucial to use social media platforms properly. I found quite surprising that Intergraf does not have an Instagram. Even though it has Twitter, it is clearly not investing so much on digital marketing with the modest sum of 175 followers. Social media made us passive, we do not search for things anymore, they just magically appear on our feeds. To target potential consumers within these platforms using data and AI, as many companies and brands are doing, can be a reasonable option and a nice help.

Aside from being crucial to speak with us through digital mediums it is even more crucial that it speaks through a fresh and youthful look. It is fundamental to invest on a trendy and attractive branding.

Values

We are a generation of progressive, social aware and open-minded people who possess a natural desire to make the world a better place (maybe to ensure our own future well-being). Our inherent activism is reflected in our everyday actions and decisions, from what we buy, to whom we buy, to where we choose to work. "According to the 2018 LinkedIn Workplace Culture report, 86% of millennials would consider taking a pay cut to work at a company whose mission and values align with their own." (Comyn, n.d.) and from a McKinsey article we can read that:

> 70% of our respondents say they try to purchase products from companies they consider ethical. [...] About 65% try to learn the origins of anything they buy—where it is made, what it is made from, and how it is made. About 80% refuse to buy goods from companies involved in scandals. (Francis & Hoefel, 2018)

It is crucial to advocate for the values young generations care about "from authenticity and inclusivity to the environment" (*The Future 100: 2020*, 2020). We increasingly believe that brands, companies and industries have a social and environmental responsibility. Although it is important to stress these values in communication mediums, it is absolutely crucial that the industry takes concrete actions and shows clear results.

There is a great research today on sustainable materials and I am sure we will see many arising in the next years. The print industry should stay in the front line of these researches in order to offer its consumers more ecological options. My generation will always prefer environmentally friendly materials, and, of course, the world thanks.

CIA understands the power of branding and just changed its image as "an attempt to improve the agency's image among young people and to represent itself as a diverse place" (Inglis, 2021). All its visual identity is now contemporary, youthful and cool.

High-tech can be a great help to reduce waste. For instance, Domino's uses AI and Machine Learning to predict accurately how many pizzas will be sold within three weeks (Davidson, 2020). This is amazing. Imagine being able to predict how many books (or anything else) are going to be sold. Huge amounts of waste would be prevented just as endless stocks that never get to be sold. However, this requires a giant database, so the industry would have to collect individuals data, be connected to stores and know their sales, and so on. How this works exactly goes beyond my intellect, although it seems to me that the Internet of Things will enable this quite easily. This might seem too overwhelming but using AI and machine learning for sales forecasting might reduce countless waste and save capital in every single sector — it is the future.[5] The biggest problem is to trust a machine over years of experience. AI will always perform better but humans tend to be stubborn and skeptical.

It is possible to take advantage of technological innovations to make the world better. It is fundamental to start taking actions and to remain sensitive to the world's prominent issues. Sustainability does not have to mean less printed materials but better monitoring procedures, per example. As important as taking concrete actions and highlighting these values within the industry, is to stress them in communication mediums, showing tangible results. We want to make sure we make part of something that contributes to a more ethical and sustainable world, thus we need to see a visible impact.

"What kind of working environment are you looking for? How could a print company provide this?"

The minute the print industry makes a 180º switch and presents itself as youthful, open-minded and future-looking it will see many young people interested in it. It seems bold to me to claim that the industry is "high-tech" when most factories are still so much attached to traditional mediums. I agree it is, in part, true that we are not looking for a job in the print industry due to an "image problem", but in this "image problem" lies some reality. There are, in fact, great issues within a factory that repel young people.

The principal problem is that neither the industry sees a clear and bright future in which it survives. Most people who work in a traditional printing factory are unsure of the upcoming years. If these adult people feel scared, imagine how a young person might feel. The current mentality of the print industry does not offer us security whatsoever. The new companies that are appearing now, that bring with them new technologies, are the ones believing in tomorrow's, and therefore, the ones who keep young adults.

The portrait of a regular printing employee is: a man in his fifties, works there for thirty years already and has no more than secondary school. As you can imagine, the environment is not very stimulating or youthful[6]. Moreover, a factory is haunted by individual monotonous and boring tasks[7]. As I already mentioned, I do not think we are looking for these jobs, unless we are desperate or it pays really well (sadly, factory wages are not usually very high). Most of us are literate, thus we are looking for a job that legitimate the years we have been studying and paying tuition fees. Besides, we are a generation who saw Mark Zuckerberg becoming one of the richest people in the world with a single computer and a

[5] AI has infinite applications and will give industries a lot of benefits, I think. It will help enhance production, reduce waste, offer more efficient services (by predicting client's needs), optimize internal processes, etc. I believe that eventually people will rely on AI to make most decisions within a factory, or even, a factory will be run by an AI alone. But probably, not so soon.

[6] In fact, only at the second week of my internship, one of my colleagues (one of those fifty years old man), after a few minutes of convenience chatting, told me in a low tone: "If you have the opportunity, continue studying. You are young, this is no job for you. Leave this. If you stay, you will age in a flash." As you can imagine, I am not thinking about staying there after my internship ends.

[7] I have already had to spend a week (40 hours) closing 25 000 envelopes by hand because the factory lacks those machines. It is incredibly exhausting.

few coding lines. Not all of us ambition to become Zuckerberg but we know that the digital world offer us greater opportunities.

We know that technology is the future and that is why we are so much high-tech driven. It is not that we are not interested in printing is just that it is a job that does not offer us a good future's outlook — unfortunately, the print industry is still not as high-tech as it claims to be. Young people want a job that feels in line with a technological world as many statics confirm: "91% of Gen Z workers say sophisticated technology would make them more interest in a workplace." (Comyn, n.d.)

We have seen our parents struggling with their lifetime inflexible jobs. We look for jobs that can offer us an healthy balance between work life and leisure. A factory is still a lot traditional on that matter. We look for jobs that can offer us flexible schedules and remote work options. Of course, machines require people to be there, but, let's suppose I have in hands a web development project, I can perfectly stay at home on monday working on that. I think we are increasingly opting for freelance jobs because it gives us that kind of flexibility. A 9 to 5 job just seems outdated to our generation. Moreover, as The New York Times article *Young People Are Going to Save Us All From Office Life* shows, we are opting for flexible schedules over high income. (Miller & Yar, 2019)

Honestly, the environment of a factory is dark, serious and quite depressing. Even when it is a beautiful sunny day outside I barely see it. This happens due to my inflexible schedule and the absence of windows in such spaces[8]. We look for spaces that offer "natural light and plenty of perks" (Gayle, 2019). Some of the coolest offices have slides, mini-golf, gymnasiums, super cool resting spaces and all kinds of facilities. It might seem that a place like this is less productive, but these are the offices of the most productive companies (Facebook, Google, Nokia are just a few examples) and the ones that keep the smartest and the best young people. I do not think a printing factory should have mini-golf, but it is not exactly about what it offers but the mentality it entails. It is about providing a fresh and happy environment in order to have happier and more productive employees.

The first step would be to educate current bosses on how to embrace new technologies and improve working environments, through national or international seminars, talks, lectures, whatever[9]. Change comes from the highest places. Despite how many young people might enter the print industry, if it feels boring and outdated, they will leave sooner or later.

These big changes demand shaking the current well-established structures, hence extremely hard to do. Naturally, not all factories will be able to do it. Most people in front of printing factories are full of old habits and concepts. No matter how clear evidences are, a stubborn brain is most times reticent to change. However, I believe there are some things Intergraf, as a representative of the industry, could provide and support that might attract more youngsters.

I have already taken part in many Erasmus programs, so I might be a little bit biased, but I find it to be one of the most awesome experiences Europe offers to young people. We are people who are a lot open to travel and to new experiences. What if Intergraf could support international exchanges between European factories? I would love to have the opportunity to work 3 or 6 months abroad. Not only would I enrich myself and my curriculum as I could also bring something new I learned out there to my home factory.

8 It was definitely one of the hardest things to get used to. On my first days I was going outside, without telling anyone, to have my snacks and just enjoy a bit of sun. Now, I got used to it but it feels sad anyway.

9 I know this already happens every year (at least, within the Portuguese Union) but most speakers are people who are in the print industry for a really long time, hence lack a future-looking vision. It is needed young enthusiastic people talking about CNC, laser-cut, AR and AI, instead of men talking about how sad it is that Lithography is dead.

Hearing us and giving us a voice is just absolutely wonderful. Most times we are silenced because we are "just kids", then we look for a place where we feel valued and heard. I truly support these initiatives and I think they can be really fruitful. I am thinking about taking advantage of (or be inspired by) other competitions such as *Cannes Lions International Festival of Creativity*, per example, in order to find the best creatives to develop marketing strategies to promote the industry. Who better to know how to attract young people than young people?

One Facebook's office. I wouldn't hate monays if my work place had a DJ mixer and such nice resting places. Workplaces do not have to be serious like they used to.

To get to know what we want and what we can offer, it is important that we can participate actively. Meetings can be a great way to spread ideas about the future and to educate adults towards young generation's values and wishes. Honestly, how many young people do you have at your national/international meetings? Federations and Associations should support and organize events for young people in order to create inspiring conversation environments. That way you might get us interested in such matters, as well as motivate us to question current problems and find creative solutions. I wouldn't mind paying for some print industry TED conference, per example. I believe we are active, dynamic and thoughtful people, we just do not know how or where to use those features. In fact, growing and learning within our job is something we look for: "59% of millennials said opportunities to learn and grow were most important to them when applying for a job." (Comyn, n.d.) If we are not growing inside our factories due to monotony what better way to learn than hearing great people sharing their ideas?

Change is hard but vital. We will no longer be looking for traditional jobs but for creative, high-tech and flexible jobs. We will look for spaces where adults respect our insights, opinions and differences; spaces where inclusivity, social and environmental values meet; spaces that continuously challenge our intellect and offer us growth opportunities; spaces that value people's well being over profit; spaces that give us a voice. We do not see jobs as our parents did. We no longer see jobs as a lifetime compromise. We no longer see jobs as intrinsically boring. Again, if it feels stagnant and outdated, we will leave sooner or later.

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