

Submission to Intergraf's 2022 Young Talent Awards

Print products and sustainability : a resolvable issue

This article was written as part of Intergraf's 2022 Young Talent Awards. I would like to thank Intergraf for giving the young generation the opportunity to share their ideas on current and hot topics.

I am a graduated student from Pagora (Graduate School of Engineering in Paper, Print Media and Biomaterials) and I am very interested in innovations mainly in the printing and packaging sectors. I really enjoyed writing this article and wish you a good reading.

Inès Capdevila

How do you see print products (graphics and packaging) in the circular economy?

Print products and packaging meet a need often defined by marketing teams. According to the specifications, designers make sure to create a product matching all requirements and respecting constraints (typically costs and development times). Then, printers and manufacturers produce the goods. At the end of the entire process, consumers obtain the products for free (flyers distribution, samples) or buy it.

This final step is often seen as the last one which is not true anymore. Once the information get to the targeted people or the content of a pack is used, the medium can be thrown away. This is where this article starts its journey with one aim that is demonstrating print products have their place in circular economy.

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Circular economy: a new trend?

The world is currently going through main transitions in order to adapt our way of lives to environmental issues. Reduce our impact on the planet is the goal of this century. To achieve this, the linear economy model is being progressively replaced by the circular economy model.

Circular economy is a recent concept based on three mainstays: eliminate waste and pollution, circulate products and materials at their highest value and regenerate nature [1]. This view is opposed to the current “*take – make – waste*” model. The transition from one model to another is a process involving populations, governments and companies. As for all change, the road can be long but it’s important to alert as we all have a key role to play.

The success of the circular economy might be curbed by the importance of money. In fact, big companies whose impact are significant are at the present time more concerned by generating profits than saving our planet. But even worse, their marketing plan make consumers believe they are involved in this new model. Therefore, I will try to submit ideas that are truly valuable and not only green washing concepts.

Print products: an immortal sector?

Print products are surrounding us in our daily life with various formats: business cards, advertising flyers, packaging, labels, posters, newspapers, books. Depending on their types, they have several roles: inform consumers, promote a product or an event and protect goods [3].

Even though, digitalization brings new ways of communication and challenges print products on several axis; studies have shown print products still have their place. In fact, people spend a lot of time in front of screens and may be more receptive to print products in terms of advertising for example. Packaging also have a large influence on the consumer as it reflects the quality of a product. Based on those observations, print products still have years to live but their impact on the environment must be taken into account and solutions have to emerge to produce wisely. Fortunately, print products have many assets and adaptations can be done at every step.

Marketing expectations: attract consumers at all costs?

Creating a new product starts by the collection of the needs often through a marketing brief stating all specifications including the design and the packaging. This brief is transmitted to a technical team gathering experts in printing and packaging. In a linear economy model, they would look for the cheapest materials depending on the technical characteristics looked for. In a circular economy model, prices have a significant impact but the environmental aspects should be looked at closely.

To achieve this step, new tools have emerged in the last decades as the life cycle analysis [2]. This method is used to evaluate the environmental impact of a product through its life cycle from production to final disposal. It takes into account raw materials, machines consumption, transports and use. Making a life cycle analysis is tedious but valuable to have a good overview and select the most suitable materials, designs and production machines.

Marketing teams study consumer's behavior and establish a market analysis to position the product properly and to optimize its performances. The product can be an event to promote, a new chocolate bar brand or the last fragrance of a luxury brand for example. In order to attract potential targets, marketing teams rely among other tips on packaging. The purpose is to have an impact on people and causes a "crush". To succeed, designers innovate constantly to suggest incredible print products using shiny colors, specific tints, tactile effects or particular medium.

Therefore, the first step to include print products in the circular economy should pass by a change towards marketing teams. They need to bear in mind that crazy ideas are certainly achievable but don't worth it. After years of unreasonable innovation, the conception of products should respect the environment and enable waste reduction.

Manufacturers :in the heart of transformation?

Once the creation phase is done in accordance with the circular economy principles, manufacturers have to take action to satisfy designers and reduce the impact of the factories on the environment. In order to clarify the ideas, I will first talk about raw materials. Production equipments will be address in a second paragraph.

Among raw materials used to print are inks, papers/boards, flexible packaging, glues, gilding foils, label underlays or staples. For special order, other materials could be used but I will focus on the most used.

Ink is a critical point concerning recycling [4]. Inks are composed of pigments, vehicles and additives mainly chemicals. Depending on the printing process, ink composition varies facilitating or not the de-inking process. In order to improve the de-inking process, inks manufacturers are subjected to tighter regulations. Vegetable-based inks are expanding and the gamut achievable with those inks is broader even if all colors are not printable as metallic's one. Favour those inks is also valuable for workers as they contain less volatile organic compounds. Nevertheless, progress could be done

concerning the origin of the various oils used in the composition. But I think, the printing industry is on the right track, questioning its own practices.

Papers and boards are cellulose based ensuring an important recycling potential as a cellulose fiber could be recycled eight times! To produce recycled papers and boards, a part of the cellulose fibers is blank but coming from sustainably managed forests. To guarantee this sustainable management, certifications have been created. Among those specifications, the most known are PEFC (Programme for the Endorsement of Forest Certification) and FSC (Forest Stewardship Council) guaranteeing the provenance of papers or boards. For flexible packaging, consortium as the CEFLEX (a Circular Economy for Flexible Packaging) initiate strategies at a European level to build a circular economy for flexible packaging by 2025. Brands are increasingly in demand of certified material to strengthen their position in a circular economy.

As for glues, gilding foils, staples or other special materials, it is currently easier to avoid their use. In fact, those materials complicate the recycling process as the first step is to separate what is recyclable from what isn't. Globally, those materials should be reserved to niche product produced in small amounts. It's mainly on the use of those matters, that marketing and designers teams should be educated to understand the impact of using non-recyclable materials.

Now that raw materials are clarified, let's tackle the production equipments. Depending on the quality required, the substrate, the cost and the quantity produced, a printing process is selected. Two categories of printing processes exist: conventional printing (offset, flexo, silkscreen, gravure) and digital printing (inkjet). Main distinction is the use of an intermediate to print in conventional printing (named image carrier), in offset for example, the design is reproduced on a blanket and then transferred on the paper, whereas in digital printing, the design is directly printed on the paper. Therefore, digital printing appears to be a good opportunity to reduce production waste (rollers, blankets, printing plate, stencil). Moreover, paper wastage can be reduced in digital printing. In fact, once you have selected the correct colour profile, settings are defined and you print the order. In conventional printing, depending on the process, several parameters have to be mastered: temperature, solvent, dampening solution, pressure between cylinders, inkpots opening. Fit all those settings takes time and causes waste of materials. In some cases, printers don't even achieve the proof in terms of colour. Fortunately, printing engineers are working on standard to find solution and streamline processes to avoid wasting time and money each time a new order comes along in production.

Currently, digital printing is gaining market share for short run and custom products. It is not yet competitive for larger series and a critical point remain the ink used that aren't eco-friendly.

Last but not least concerning printers good will is the creation of new labels. In France for example, the label Imprim'Vert help identifying printers that set up concrete actions to decrease the impact of their activity on the environment. This initiative helps brands to choose printers knowingly.

Consumers: the weak link?

Marketing, designers and manufacturers have done their job. The attractive colours and designs have seduced you and the product is in your hands. You take it home, keep it for a while and throw it away. To close the loop, I hope you have put it in the right bin. Thanks to awareness campaigns, you may have succeeded. It is now easier to sort out waste as we have colour code and collection points multiply even in small cities. The youngest generation teaches the oldest, more reluctant and is key to the circular economy success.

Sorting out is crucial but as a consumer we also have to be sensitive to packaging that may be less shiny and colorful. In fact, as for human, packaging is only the surface and the product is inside. As consumers, we have to look for information to identify brands that have a real impact and not only catchy marketing slogans.

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Considering my presentation, I think print products have their place in the circular economy model. Print products are useful and will not disappear from our daily life. They have many assets and transformation has already begun. People are now aware of the environmental crisis we are facing and slowly but surely, behaviours and ways of producing will change. However, we need to remember that our industry is not alone and collaborative work is the key to set up successfully circular economy.

What is your vision for print for a sustainable future?

Environment is a main concern for a significant proportion of the population. Natural resources have to be preserved as well as flora and fauna. In 2021, the overshoot day occurred on July 29th; this day “marks the date when humanity’s demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year” [5]. We are facing an ecological emergency and the industry has to assume its responsibility.

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Printing industry: a resource killer?

People often see us, workers of the printing industry like forest killer. In the collective imagination, printing requires unimaginable quantity of trees to inundate the planet with useless products. This false belief is due to misinformation and a lack of knowledge about the industry. In fact, as mentioned previously, papers and boards are easily recyclable if printed with eco-friendly inks and less chemical finishing coats.

To help consumers, labels and certifications are created to control the substrate provenance and favor the use of recycled materials. Consumers are informed of the recyclability of a material through icon like the Mobius loop and are able to sort out waste to put resources back into circulation. In France, data indicates the recycling rate for paper/board reach 64% and 28% for plastic [6]. The potential for improvement is high but the awareness campaigns and the multiplication of articles on this topic will surely help increasing those figures in the coming years.

Research and development enhance by companies will enable the creation of lighter packaging using the most eco-friendly properties while preserving the product correctly.

A packaging in your living room ?

When talking about sustainable future, recycling is often at the heart of concerns. Another point of view is to imagine how the consumer could reuse the packaging. Among solutions, we can find compostable bags, edible packaging, cardboard boxes that can be transformed in seat or kennel for your pets.

In fact younger generations like to collect uncommon articles. A magnificent poster, a packaging box transformed as a pencil holder. Those disposable objects could become immortal. Those new ways of conceiving packaging are still marginal but have a high seductive power on consumers. Indeed, I think it could be an efficient way to attract new consumers.

Printing engineer : a key role ?

Dear expert reader, when you do your shopping and see products packed by unit or beautiful gift box full of non-recyclable particular features, you may find my vision quite optimistic.

I think young engineers with strong technical backgrounds and real desires to have an impact must dive headfirst in jobs that make sense for them and for the planet. The future for youngest generation seems bleak according to the news we hear all days long but it's also time to try, suggest and find sustainable solutions to preserve the planet.

Companies are opening their doors to young versatile people and willing to involve themselves in new challenges. We don't have to be afraid to take our role in this society.

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Print can totally register in a sustainable future as it allies significant assets. Moreover, companies are strengthening their Corporate Social Responsibilities to consolidate their position and encourage a sustainable growth with long-term carbon emissions reduction.

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