ISSN: 2277-9655
Impact Factor: 4.116

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

THE INFLUENCE AND IMPACT OF DIGITAL PRINTING ON CARBON FOOT PRINT OF PRINT INDUSTRY

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DOI: 10.5281/zenodo.56032

ABSTRACT

Sustainable print industry needs to focus on eliminating waste and reducing their carbon footprint. Print services can accommodate this by using better equipment, good planning, and advanced manufacturing and printing technology. The carbon footprint of manufacturing and transport as well as overall energy use in print manufacturing could be reduced substantially and thus global "resource productivity" can be greatly enhanced and carbon emissions can be reduced. 3d printing Reduces material waste and scrap it also limits the amount of energy used. The more efficient use of raw materials and need minimal harmful (e.g., etching) chemicals make it an environmentally friendly production process. Hence reduces the overall Carbon footprint of a given product.

INTRODUCTION

In today's eco conscious world, sustainability is no longer a "nice to have"; it is a must-have for printing and packaging industry and an imperative to operate by every day. Printing and Packaging is part of our daily lives – virtually everything we purchase, consume or make comes in some kinds of printing and packaging. And as a result approximately 23 percent landfill waste coming from printing and packaging industry. Printing and Packaging materials such as paperboard, are made with fibres from responsibly managed forests, 100 percent renewable fibre, post-consumer recycled content, or treated with plant-based coatings, give the printing and packaging industry opportunities to integrate sustainability into every step of the printing and packaging development process. And if sustainability is a key part of our operations and particularly our brand promise, we must also consider incorporating green thinking in terms of water, energy, and environmental efficiency and protection.

The printing industry uses various printing technologies for printing books, magazine, newspapers, business documents, catalogs, form, etc. These technologies include lithography, rotogravure, flexography, screen, letter-press, and digital technologies including inkjet and electro-photography. The use of these technologies depends on the required quality of the print, number of impressions to be printed, availability of required resources, cost of the equipment, consumables cost per unit, need to use variable content, and other factors.

Printing operations use materials that may adversely affect air, water, and land resources: certain chemicals involved in printing volatilize, which contributes to air emissions from the facility and to smog formation; other chemicals may be discharged to drains and impact freshwater or marine ecosystem; and solid waste contribute to the existing local and regional disposal problems.

It is important to note that waste do differ from process to process and the methods of reducing waste in one printing process do not necessarily apply to other printing processes. There are three major waste streams found in the printing industry. They include:

Solid waste – in general printing environment solid waste could consist of the following: empty containers, used film packages, outdated materials, damaged plates, developed films, outdated materials, test production, bad printing or spoilage, damaged product, and scrap papers

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Water waste – water waste from printing operations may contain lubricating oils, waste ink, and clean-up solvents, photographic. Chemicals, acids, alkaline, and plate coatings, as well as metals such as silver, iron, chromium, copper, and barium

Air emissions – printing operations produce volatile organic compound emissions from the use of cleaning solvents and inks, as well as alcohol and other wetting agents used in lithographic printing. Larger plants can be the source of sulphur dioxide emissions. Finishing operations may include final trimming, die cutting, folding, collating, binding, laminating, embossing, and assembling operations. Binding methods include stitching (stapling), gluing, and mechanical binding. The primary waste are binding and laminating chemicals and scrap papers.

The flow of materials and work through a printer is remarkably similar, the main difference being the type of printing operation being undertaken. So the main printing processes listed above can be substituted in the printing operations box with the other issues remaining virtually unchanged. A typical printer has the following process flow chart:

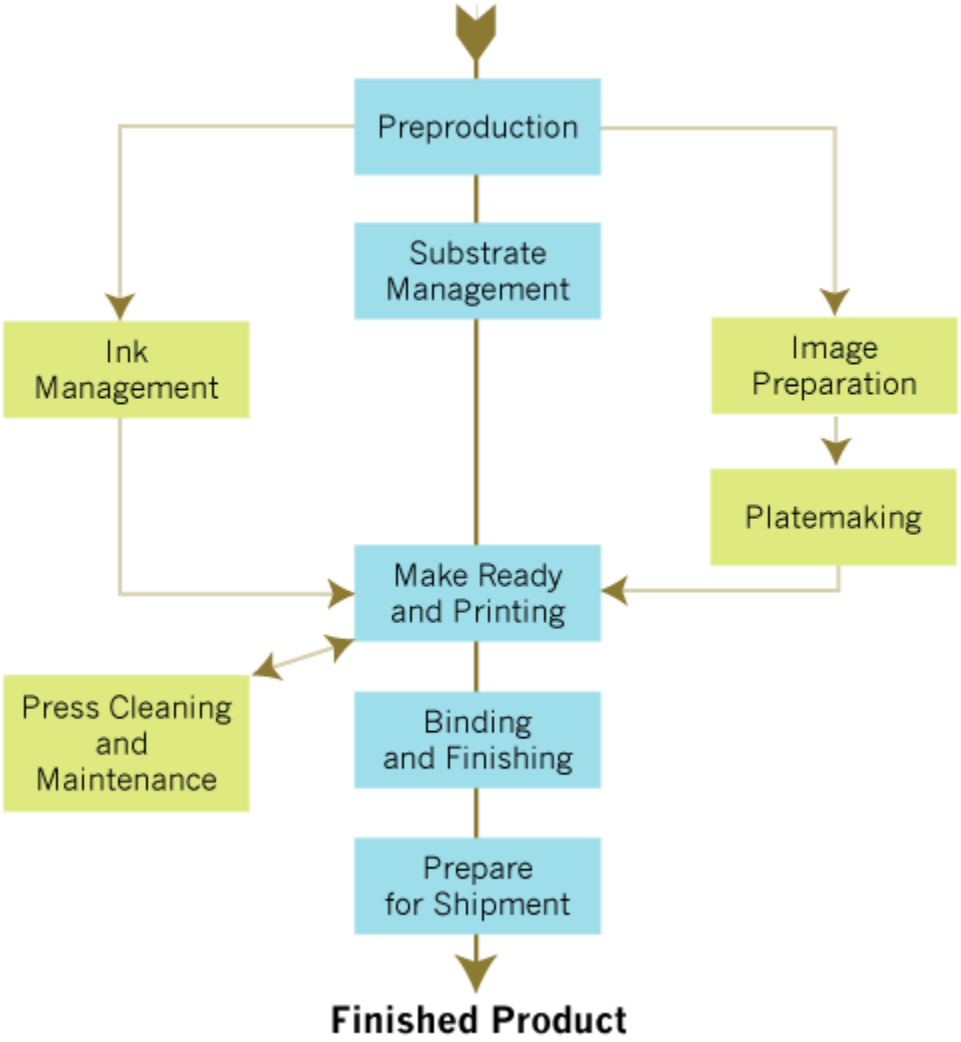

Figure 1 Process Flowchart of a Typical Printer

Waste minimisation

Waste minimisation assists in reducing commercial pressures by: Cutting costs largely due to the savings from diverting wastes from landfill disposal to recycling. Lifting the environmental image of the company and therefore

attracting new environmentally sensitive customers. Improving staff moral, therefore productivity do more than just make money for the company and its shareholders, reducing regulatory pressures on the individual company and on the industry as a whole. Improving public perception of the printing industry as one of green and clean Most of the market leaders in waste and environmental management in the printing industry are at the larger end of the market. Larger companies have more resources to invest in identifying and implementing efficiency gains. The printing industry is no different from many other industry sectors, with a sharp difference between waste management practices of large and small printers. Common methods to reduce waste in print industry are:

Reduce...
Design to Prevent Waste. Put more words on a page by using smaller fonts and margins. It is not necessary to begin a chapter on the right side of facing pages. Choose a thin cover stock or eliminate the cover.
Double-Side Documents. Be sure to use both sides of the page whenever possible.
Order Only What You Need. Volume discounts may make it economical to order more, but can you really use 1000 or 5000? Anticipate corrections and changes (will your business be moving or changing its phone number?).
Request Vegetable-Based Ink. Soy and other vegetable-based inks help prevent air and water pollution. They also give brighter colors and rub off less on the reader's hands.
Request Least Toxic Colors. Some ink colors are less friendly than others because their pigments contain toxic heavy metals. Ask about heavy metals when choosing colored ink. Avoid metallic and fluorescent inks.
...and Recycle
Choose Paper That is Locally Recyclable

- White paper is usually the most recyclable.
- Avoid fluorescent and goldenrod paper.
- Avoid plastic covers and bindings.

WHAT DIGITAL PRINTING OFFERS

Digital printing eliminates many of the mechanical steps required for conventional printing, including making films and color proofs, manually stripping the pieces together and making plates. It also offers shorter turnaround of jobs. Every print is the same with digital printing process. It also offers more accurate counts, less waste and fewer variations, due to not having to balance ink and water during press run. Digital printing provides cheaper low volume printing. While the unit cost of each piece may be higher than with offset printing, when setup costs are included digital printing provides lower per unit costs for very small print runs.

Digital printing process offers variable Data Printing which is a form of customizable digital printing. Using information from a database or external file, text and graphics can be changed on each piece without stopping or slowing down the press. For example, personalized letters can be printed with a different name and address on each letter. Variable data printing is used primarily for direct marketing, customer relationship development and advertising.

CONCLUSION

Digital printing and offset printing both produce high quality, professional looking products. But they are two different technologies that have different capabilities and one may be a better option than the other depending on your project. Since there is no set up charge for creating plates, digital printing is much more cost effective for small run projects less than 500 to 1000 pieces. This also means turnaround times are faster and expediting a project is usually cheaper. Text based black and white printing can be very economical with digital methods. Digital printing is also used when customization of each piece is required, for example an advertising piece that includes the name of each client receiving it. This revolutionary technology is likely to dramatically change business models, shift production location, shrink supply chains, and alter the global economic order. Digital printing also produces less waste, which is most important if the industry has to become diligent about being eco-friendly. It eliminates any waste associated with the plate making process. It also eliminates unusable pieces that are created at the start of a run, before the ink is properly distributed on the plates

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