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The Role and Future Potential of Books and Book Printing in the European Knowledge Economy

ABSTRACT

The authors—who have been working in the world of printed books for decades—sought to identify the challenges and trends that will shape Europeans' future relationship with printed books by analysing recently published academic papers, conference presentations, and expert reports. The report details the driving forces that will have the greatest impact on the European book printing market in the future, as follows. End-user preferences are changing the demand for printed books and other formats. Changes in physical book production methods are driving significant market shifts. Optimizing book production locations will become necessary as supply chains evolve, publishing business models transform, and print-on-demand becomes more widespread. A focus on sustainability - reducing waste during production and throughout the supply chain - is of paramount importance. The availability and cost of paper will be critical following the closures of paper-making machines and mills. The authors also seek to determine what role printed books might play in the development of the European knowledge economy, amid the spread of digitalization. They highlight the strengths of printed books, particularly their proven benefits for reading comprehension and learning. Alternative channels and social media can give printed books a boost. Viral marketing can boost sales of titles. BookTok, a sub-community on TikTok focused on books and literature, has become increasingly popular. Members of this sub-community (known as BookTokers) create videos in which they review, discuss, and joke about the books they've read. The printed book has a unique dual nature: it is both a cultural and a technical product. In this regard, its physical appearance is also important. The authors present the results of a joint research program conducted by Óbuda University and Alföldi Nyomda PLC. - Hungary's leading book printer - which aimed to create modern, attractive visual designs for books and implement them technologically, as well as to develop connections and integrations with digital devices.

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KEY WORDS
Book publishing, trends and driving of book printing, new methods of book sales, impact of reading

1. Introduction

The book is a "fantastic product" with a unique dual nature. It is both a cultural and a technical product. For printers, a book may simply mean paper, ink, and manufacturing processes. For publishers, however, it embodies culture, ideas, and intellectual exchange. Both dimensions are indispensable and inseparable. Without technical excellence, there can be no physical book. And without cultural value, printing has no meaning.

Printed books are expected to continue playing an important role in European societies in the future, particularly considering their proven benefits in the areas of reading comprehension and learning (INTERGRAF, FEP & CEPI, 2023).

Óbuda University and Alföldi Printing House—an iconic institution in Hungary with a history spanning more than 460 years—are conducting a joint research program aimed at exploring the expectations of the younger generation of book users regarding print communication. How should the design and production of books be adapted to meet these expectations?

As part of this research program, the authors summarize and analyze the trends expected in the world of books, which will also be the main drivers of the book market and book production in the aftermath of the COVID-19 pandemic. What are the typical changes in lifestyle and habits? How are sustainability issues evolving? What are the consequences of the rise in digital printing and the increasingly widespread use of electronic end-user products? How are these developments being influenced by the explosive growth in production costs?

2. Research methods

The authors—who have been working in the world of printed books for decades—examine recently published scholarly articles, conference presentations, and expert reports to identify the challenges and trends that will shape European societies' future relationship with printed books.

The data presented in this article—regarding book publishing and printing—covers both Western and Eastern Europe, including all 27 EU member states, as well as the United Kingdom, Norway, and Switzerland.

Books include black-and-white and color hardcover books; paperback and flip-through books; educational and religious books; works of fiction and non-fiction; children's books; travel books; general-interest books; art books; and reference books. This category also includes privately published works but excludes photo albums and yearbooks.

Value data have been converted to euros in 2024 constant prices and exchange rates to reflect actual changes in demand, considering the effects of inflation (measured by the consumer price index) and exchange rate fluctuations. Data on print volume is expressed in A4-equivalent pages.

3. An overview of the European book publishing and printing market

In their analysis, the authors drew on the presentations given at the "Shaping the Future with Books 2026" conference held in Brussels in February 2026, as well as on the facts and data published in the "INTERGRAF Book Market Report 2026"—a joint publication by INTEGRAF and SMITHERS (Smithers, 2021) related to the conference— supplemented by conclusions drawn from other academic publications and their own research findings within the scope of this article.

3.1. Book publishing overview

According to the Federation of European Publishers (FEP) the European book market reached its highest ever nominal turnover in 2024, at €24.9 billion. This FEP data covers most major European publishers, but not all. The 2024 figure is nominally ahead of the previous 2007 peak but when adjusted for inflation the turnover is down to €15.5 billion, compared to €22.2 billion in 2007. Partly this is because book prices have risen 38.3% over the past 20 years, far below general inflation (64.1%), putting sustained pressure on publisher margins. The FEP report on the European book market also highlighted a worrying trend in reading engagement identifying 47.2% of Europeans aged 16 and over as non-readers (source: Eurostat). The main reason is lack of interest, not affordability.

Printed books still dominate accounting for 82.9% of the total, but audiobooks are the fastest-growing segment, reaching 4.2% of sales in 2024.

It is difficult to accurately track data on audiobooks due to various subscription models and players such as Spotify, which have the potential to disrupt the status quo (and make tracking more difficult). Europe is a net importer of books; UN Comtrade data show a net deficit of $1.04 billion in 2024. The data in Table 1 show the value of books at the publisher level, not the value of book printing.

Table 1

2024 European book publishing export and import trade ($ million) (UN Comtrade)

	2020	2021	2022	2023	2024
Import	7 737	8 388	7 325	6 968	6 862
Export	6 584	7 289	6 629	6 161	5 827

The Commodity Trade Statistics Database of United Nations Statistics Division is the source for Table 2. Printing children's books shows a significant net import balance (especially from China), reflecting the complex binding and finishing involved in many pop-up books requiring high levels of manual processing.

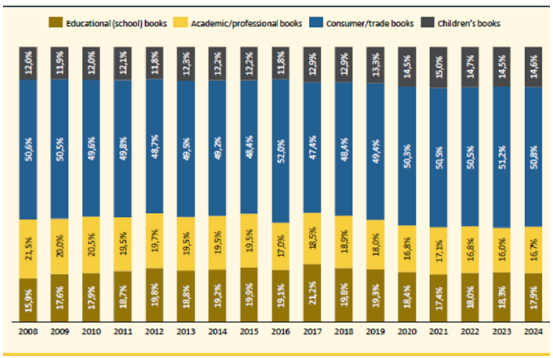
The aggregate revenue data for European publishers is shown in Figure 1, with percentages listed by category.

Biggest segment is consumer/trade books where publishers make money on the best sellers. Popular books don't change and are not time sensitive, so often mass produced and warehoused.

Table 2

2024 European book printing export and import trade ($ thousand)

Commodity	Export value (US$)	Import value (US$)
Maps and hydrographic or similar charts; printed in book form, including atlases, topographical plans and similar	26 432	12 321
Printed matter; children's picture, drawing or coloring books	306 465	653 235
Printed matter; dictionaries, encyclopedias and serial		
instalments thereof	60 261	33 464
Printed matter; books, brochures, leaflets and similar		
printed matter	7 277 091	6 141 257



» **Figure 1:** *European Publisher sales by category 2008-2024 (Smithers, 2021)*

3.2. The market for book printing in Europe

The value of the European book printing market was 7.8 billion euros in 2025; it has been growing at an average CAGR of 1.5% in constant terms since 2020, although that year saw a sharp decline compared to 2019 due to the COVID-19 pandemic. Tables 3 and 4 present the aggregate European and Hungarian book printing industry revenue and nominal output, including projected trends for the next five years.

The European book printing market was valued at 7.8 billion euros in 2025; since 2020, the average compound annual growth rate (CAGR) has not increased; in fact, it has declined slightly (0.1%). In 2020, a sharp decline was observed compared to 2019 due to the COVID-19 pandemic. However, significant growth is projected for the next five years

The pandemic also caused a significant drop in revenue in the Hungarian book printing industry, but performance subsequently improved dramatically. Its outlook for the future follows the European trend.

The situation is different, however, when it comes to printing output. European printing companies are producing fewer books overall, and this trend is expected to intensify in the future. The exceptional volume figures achieved in Hungary in 2024 and 2025 will not be repeated.

Figure 2 clearly illustrates the trends outlined above.

Table 3

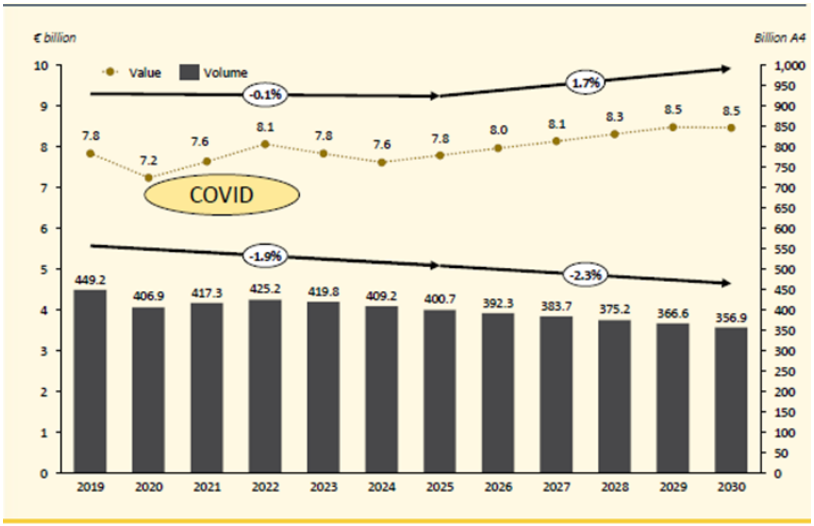
European and Hungarian book printing market by print process 2019-2030 (€ million, constant 2024 values)

	2019	2020	2024	2025	CAGR (%), 2020-25	2026	2030	CAGR (%), 2026-30
All Europe	7,836.2	7,237.4	7,613.9	7,784.4	- 0.1	7,960.0	8,462.7	1.7
Hungary	47.9	45.1	59.1	60.0	5.9	60.7	64.6	1.5

Table 4

European and Hungarian book printing market by print process 2019-2030 (A4 million prints or equivalent)

	2019	2020	2024	2025	CAGR (%), 2020-25	2026	2030	CAGR (%), 2026-30
All Europe	449,212	406,903	409,208	400,671	-1.9	392,270	356,922	-2.3
Hungary	3,609	3,182	3,822	3,811	1.7	3,780	3,663	-0.8



» **Figure 2:** *European book printing output, 2019-2030 ($ billion, billion A4 equivalent) (Smithers, 2021)*

4. Trends and drivers shaping book manufacture in Europe

The key drivers having the greatest influence on the book printing market across Europe going forward are listed below:

- Changing physical book manufacturing methods.
- Changing book manufacture location as supply chains develop and publisher business models change, the rise of print-on-demand.
- Sustainability – reducing waste in manufacture and across supply chains.
- Availability and cost of paper following paper machine and mill closures, the potential impact of Eu Regulation on Deforestation-free Products (EUDR) (although currently books are outside the scope of the regulation).
- End-user preferences change demand for printed books and other formats.

4.1. Book production … is a changing world

During the period under study, significant changes have occurred and continue to occur in book printing technologies and methods. The share of digital printing has been steadily increasing throughout this period. In 2020 digital print- electrophotography and inkjet- accounted for 38.4% of the value of book printing and this will grow to 67.3% by 2030 as more on-demand book manufacturing is used. The value is greatly ahead of print volume, and in 2030 digital will account for 29.0% of output volume. For print suppliers the value of digital book printing is a major opportunity as the services provided to publishers help them serve the book buyers over the useful lifecycle for their title, keeping more titles in print and extending the long tail.

High levels of automation and efficient job changeover make offset litho an efficient technology relative to other analogue printing processes; however, sheetfed offset litho lacks the versatility of digital printing and the technology is not well suited for print on demand.

The use of webfed offset printing for book production remains important, especially for long run production but is declining and both coldset and heatset volumes and values fall throughout the review period. Coldset web litho is used to print diaries, religious, educational and trade publications as well as trade fiction and graphic novels in both hardback and softback format. Heatset offset litho and, to a minor extent, gravure is used for long run color printing. Some book presses have heatset dryers that are typically used for color printing and can be switched off when not required, for example when printing single color work. The market for new web offset book presses has stalled, and at the time of writing it is believed that there are no manufacturers of these presses left, although the existing installed base is kept running with spares and service often supplied by third parties (Moreau & Wells, 2018).

Inkjet printing is taking share of all other print processes including electrophotography. Although electrophotography is being replaced by inkjet, it remains an important part of the business and is widely used for covers, illustrations, some text and picture books.

Table 5 illustrates the changing role of printing technologies in book production. Digital printing takes more value as it can offer faster turnaround, short runs more efficiently keeping more books in print (important for publisher author contract relationships).

Table 5
Trends and outlooks of book sector by process

Book Sector by Process	Print trend	Outlook
Web Offset (heatset) + Gravure	Medium to long run color books – education, coffee table/hobby interest titles	Decline will continue as average runs fall. Commercial presses may generate high levels of trim waste. Inkjet is increasingly competitive at medium to high runs
Coldset Web	Medium to long run mono books – education, hobby interest titles	Decline will continue as presses wear out and skilled litho press minders are difficult to recruit and retain
Sheetfed Litho	Color for softback covers, hardback jackets, color plates	Declining for text sections, still used for covers but fewer specialist mono sheetfed perfecting presses in use as digital machines that can deliver paginated blocks
Inkjet (Webfed)	520-1.4m width, perfecting presses either full color or mono (some 2-colour). No cut off restrictions to minimize trim waste, no section imbalance, any pagination	Integrated and near-line automated finishing. Single-pass book block production with no endpapers or section imbalance waste. New presses e.g. HP T500M filling gaps in coldset machinery
Inkjet (Sheetfed)	Short runs, covers	Growing as inkjet sheetfed installed base grows, B3 as well as B1/B2 where take up has been patchy.
Electrophotography	Mono continuously declining/dead, mono cut sheet for short runs. Color cut sheet for covers/jackets and short run.	Still used in covers and short run color books, use reducing in

The growth of inkjet is due to its ability to enable fast, efficient and cost-effective production of book blocks or folded sections and the technology is the driving force behind print on demand publication. Inkjet and toner printing is used by Amazon who own several book printing facilities in the US, Europe and Asia. These are used for fulfilment of online book ordering through Amazon's marketplace as well as for producing print on demand publications for independent authors through the Amazon KDP (Kindle Direct Publishing) programmed that allows self-publishing in both physical and e-book format. Other providers offer similar self-publishing portals with in-house and bought in print capacity.

Over the past fifteen years there have been significant developments in digital print technology, combining

print with web finishing and binding to manufacture books effectively in a single pass, enabling the economic production of single copies if needed.

4.2. Localized and regional printing models … print isn't necessarily at the printer anymore

E-commerce and changing consumer behavior have transformed books into immediate-demand products. Readers increasingly expected next-day, or even same-day delivery. As a result, printers and publishers had been forced to adopt faster replenishment cycles, shorter production times, and tighter inventory management. This expectation of immediacy was unlikely to disappear and that the industry must evolve accordingly.

In addition to technology, printers should focus on supply chain management and total cost of ownership. Publishers, too, must look beyond per-unit printing costs and consider warehousing, obsolescence, tied-up capital, and environmental impacts. Managing the total cost of the supply chain has become critical to survival.

Subscription-based models and premium editions have transformed books into collector's items, thereby reducing dependence on significant retail discounts.

Printing no longer necessarily must take place at a printing plant. Production can take place wherever it best serves the efficiency of the supply chain. CPI (one of Europe's leading book manufacturers) operates distributed printing networks in the United Kingdom and Germany, with partners in North America, India, Australia, and Singapore. Approximately 20% of on-demand print orders are not produced locally but are routed to international partners, demonstrating a flexible, file-driven production model that minimizes shipping costs and carbon emissions while improving cash flow.

Localized, digital, and on-demand printing models offer both economic and environmental opportunities. Although these models may to some extent displace traditional high-volume printing, they provide flexibility in a market defined by speed, cost pressure, and

sustainability requirements. Digital printing technologies are essential to these models, as they enable scalable production starting from a single copy.

4.3. Sustainability … is not a trend anymore, it is real business

Climate change is one of the biggest topics in the modern era with a huge emphasis being put on environmentally friendly actions for people, companies, and countries. This topic is at the forefront for many consumers and will often influence their feelings towards a company and its products. This mind-set from the public has put pressure on, governments and unions, as well as businesses, to promote sustainable practices (Gladysz et al., 2021).

Sustainability is growing in importance for print suppliers and their publishing customers. The promise of electronic and audio alternatives to physical books included boasts about being more sustainable, but only if the impact of requirement for an electronic reader and power is not included. The consumer demands are making most reputable publishers use sustainably sourced paper and board, with FSC and other certifications widely used. The forthcoming EU deforestation regulations (EUDR) made publishers obtain detailed full-chain traceability information from paper mills, pulp suppliers and printing partners to prove their credentials. EUDR may affect book supply chains in future but in December 2025 the European Parliament plenary vote in favor of the provisional agreement reached with the Council on the EUDR-amending Regulation. This means printed books, newspapers, pictures and other products of the printing industry, manuscripts, typescripts and plans, of paper' have been exempted from the EUDR. Despite this many print providers are offering independently certified and traceable sources of materials used in book manufacturing.

Printers must increasingly prove their credentials by providing clear emissions data about their products. Intergraf recommendation on CO2 emissions calculation in the printing industry', was published in 2013. This recommendation was the only international graphic standard for carbon calculation in the world, designed to ensure that everyone who uses it calculates on the same basis (International Organization for Standardization, 2013).

4.4. Consumer trends … social media is stealing time from consumers to read books

Reading is a very environmentally-friendly activity – be it in the physical or digital world. Retail is not physical vs. online, it is omnichannel. „Print has a strong value proposition for consumers", with price not even in the top five selection criteria of where and why one buys a book. This led to the conclusion that "a beautifully printed book remains important even in an omnichannel market". (Andre Breedt, Nielsen Book)

4.4.1. How do 15-year-olds read in today's world?

37% of students rarely or never read books; 36% read books more often in paper format; 15% read books more often in digital format; and 12% read books equally often in paper or digital format (OECD, 2023)

When comparing between different kinds of readers, the OECD found that "in high-performing education systems more students tend to read books more often in paper format", while "in low-performing education systems more students tend to read books more often using digital devices".

4.4.2. Consumer behavior perspective

Demand for books is ultimately determined by the preferences of readers (or boards of education in the case of school and university text and workbooks). As technology develops there is more choices with titles available as physical books (with associated supply chains) or digitally like e-books and audio books. In education there are many alternatives to traditional printed textbooks including teacher guides, etc. The threat of e-books replacing physical books has not come to pass, with audio books the fastest growing segment (Horvath, Loós & Remete, 2023)

The alternative channels and social media can provide a boost to physical books. Viral marketing can boost titles. BookTok is a subcommunity of TikTok that focuses on books and literature, emerging in 2019 as TikTok became more popular. Members of this subcommunity, (BookTokers), make videos reviewing, discussing, and joking about the books they read. Publishing houses are increasingly collaborating with BookTokers, elevating them to editors in the hope of finding the philosopher's stone, to unearth the next bestseller among the thousands of new releases (Capitani, 2025).

One publisher interviewed noted the impact of this group, citing one example a book on royal dress making taking off when "Megan Markle happened" leading to orders of 50,000 copies as the title took off. Sweden is a case study in the rethink of screen-heavy education and the return of printed books to the classroom.

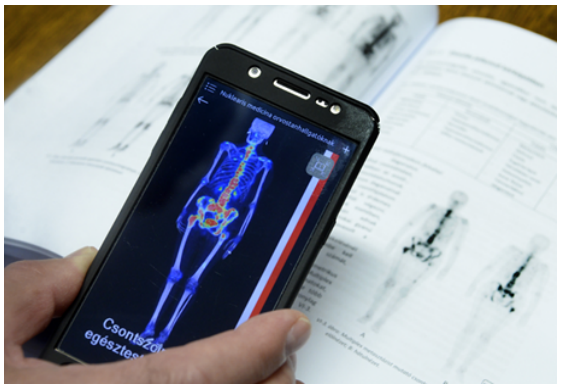
In 2009, Sweden adopted a policy of favoring digital tools such as tablets and computers in the classroom at the expense of printed textbooks with the aim of preparing students for a digitized world. But credible studies showed a decline in educational standards. A global assessment of reading levels, the Progress in International Reading Literacy Study (PIRLS) showed a decline among Sweden's children between 2016

and 2021. In 2023, Sweden's Education Minister Lotta Edholm attributed the decline in academic standards partly to an overreliance on digital devices, saying: "Sweden's students need more textbooks, physical books are important for student learning". To combat this decline, the Swedish government announced an investment worth kr685m in book purchases for schools, with another kr500m investment in 2024 and 2025 to speed up the return of printed educational books.

4.4.3. Books connected to the digital world

The future is digital, in more ways than one, from the production of books to the methods of purchasing and consuming products. The following is an example of the use of augmented reality (AR) in the world of printed books. The purpose of the LibrAR mobile application developed by Alföldi Nyomda is to extend and expand the information that appears in the book.

The camera of the mobile phone or tablet is pointed at the page of the book, and something else appears in the place of the image, e.g.: another image, an image gallery, animation, a 3D model that can be walked around virtually, a video, an audio file starts, but it is also possible, to launch the phone's navigation program and navigate to a specific geographic location, but we can even discover hidden content in a book through it. The special feature of the application is that there is no need to spoil the overall image of the book, for example by placing a QR code, only a well-recognizable image and a so-called marker are needed. Most images and graphics can be used as markers. All that is needed is that it contains sharp, contrasting angles. And the librAR corner mark printed on the corner of the image is just to inform the reader: this image is more than meets the eye. The application of AR therefore opens new dimensions in the world of books and enables readers to have a much more interactive and enjoyable experience (Horvath et al., 2020).



» **Figure 3:** *LibrAR application in use*

4.4.4. The hottest trend in publishing … books you can judge by their cover

Elaborately designed books with patterned edges and other effects started as a trend in romance and have now spread throughout the publishing industry. Printing enables publishers to create even greater value from their existing content.

Paradoxically, the book acquires physicality to be easily communicable digitally: to use a neologism, we could say that it must be "Instagrammable". Translated into concrete terms, to use the American expression: "bold colors, big typography, and a visual hook", i.e. large, bold lettering, splashed across the cover in bright colors to capture the attention of users on social media, where images should stand out quickly to stop the scrolling (Capitani, 2025).

Beyond graphics, in response to the growing attention to book aesthetics, many publishers have introduced tactile elements and special details throughout the volume. Features such as colored or decorated edges (sprayed edges), which are so fashionable today, as well as embossing and special finishes, have become commonplace, transforming books into collectables.



» **Figure 4:** *Books with metallic gilded edge*

Metallic gilded edge – this effect used to be created by painting or dipping the book into a solution but now can be inkjet printed.

Red Tower Books produced 2 million copies of the deluxe edition of ONYX STORM and 500,000 copies of the regular version. The deluxe version was a collectible hardcover with sprayed edges, stenciled artwork and other special design features.

1. Conclusions

The Entire Book Publishing Eco-system is rapidly evolving due to fast changing consumer preferences, increasing volumes of data and drive to eliminate waste.

- Printed Books are highly resilient in the Digital Age because consumers want a tactile, emotional experience
- Books are more than just carriers of information – they can be luxury objects, collectible items or status symbols.
- Publishers are experimenting with different formats – often blending the digital and the physical.
- Better forecasting is leading to fewer unsold copies, reducing publisher's risk – as a result printing is becoming more efficient and generating less waste.
- Digital printing is growing – big opportunities in inkjet in print on demand.
- The workflow of book production is changing- digital print enables more efficient book manufacturing (not just small quantities)
- There are many opportunities for printers to capture more value of the book production process.

Book printers are no longer just printers; they provide publishing supply chain support!

2. Acknowledgments

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