Business white paper

a re-balanced approach to print and digital

brings new profitability for publishers

The print book ecosystem is in transition globally

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Today is a new opportunity for publishers to harvest unprecedented profitability from print. Publishing executives have spent time and energies during the past 5+ years on dealing with strategies and workflows to address the growing digital marketplace. But the printed book has been largely ignored during this period of hyper-focus. There is a growing body of data that supports the continuing importance of the print book over the next 10 or more years. The disruption of the print book ecosystem means that publishers need to re-balance ongoing digital opportunities with re-addressing the printed book supply chain in fresh ways in their strategic planning. Start the process now.

With the furor created by the rapid growth of e-books during the last 10 years, many publishers have given little time, or had little cause, to consider the impact of technological innovations in the print book world. In the US and UK, the concern with print was typically to register alarm at the declining sales of print book units. Beyond these markets, worldwide data indicates that the number of books printed steadily declined over the last four years, while total title volume rose due to the growth of e-books.

WW Books – Volume

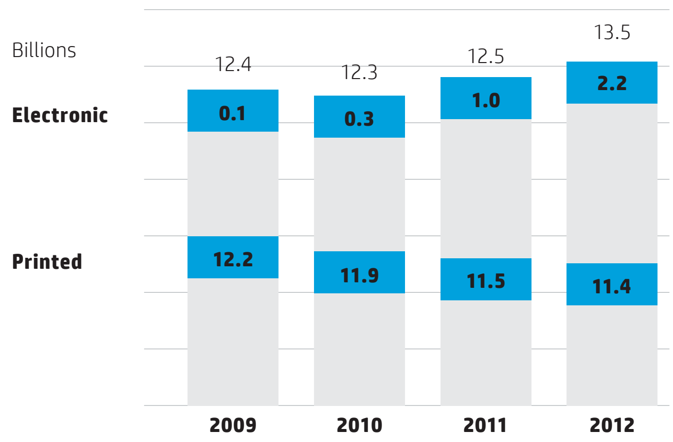


Figure 1. Source: **Hewlett Packard**

Bookscan international territories

All territories in decline, with the exception of India.

Year on year change, 2012 vs 2011 total value sales

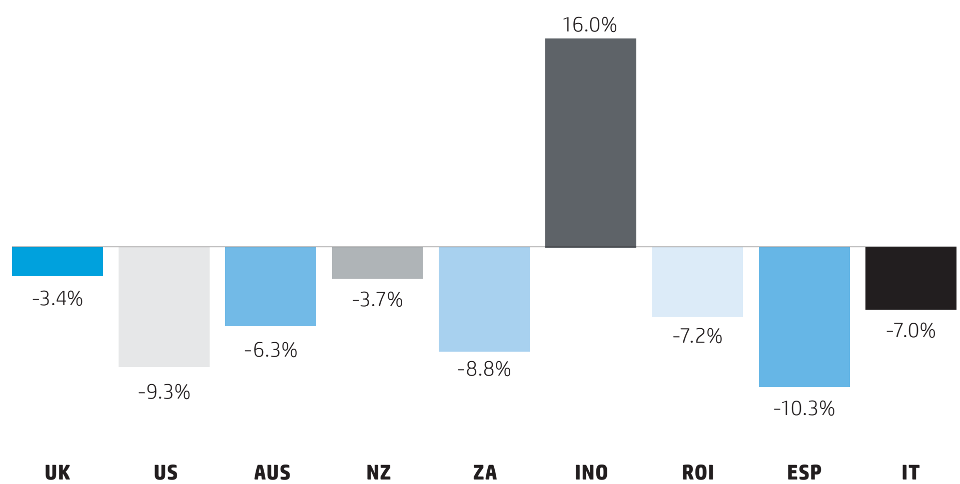


Figure 2. Source: **Nielsen Bookscan**

For the US trade market, Nielsen recently reported a consecutive three-year 9% decline in book point-of-sale units. Further, mass market paperback sales have been decimated by e-books, and adult hardcover and trade paperback sales have declined in double digits for the same three-year period. According to the AAP sales reports in the fiction category, e-books are the #2 sales format, closing fast on the leader hardcover. Globally there are regions still experiencing print growth, but disruption in digital is projected to eventually impact those trends. Even in the US, children's books and other illustrated book categories still show growth in print. But more than just declining sales, a larger challenge remains: the print book ecosystem is in transition.

The Great Recession's overall economic impact; the booming sales of smart phones, tablets, and e-readers; and the concurrent shrinking of physical book stores have created a serious threat to the survival of the print book ecosystem. Authors, agents, publishers, printers, booksellers and readers are all impacted. So where does this leave a typical book publisher in 2013 and beyond?

Strategic challenge in response to disruption

For publishing, responding to disruption demands that business strategy adapt at an accelerated pace. As the speed of change increases, more opportunities and threats emerge on which to act, and to act on quickly. Chris Zuck's Repeatability tells us that only 9% of companies achieve profitable growth, but only 1 in 10 executives say that they did not recognize opportunities to grow profitably. Shrinking the gap between achieving profitable growth and perceiving the opportunity for growth is the key. Successful companies best leverage what Zuck found to be the root cause for success: the ability to learn and improve, then to apply what is learned to succeed in the next challenge. The best competitors transfer learning faster than the other players.

Fortunately, publishers can benefit from the experience of other industries that have gone through similar disruptive times. Business theorist Clayton Christensen built his reputation by studying innovation and changing technology and its importance to a company's future success. In his recent work in the Harvard Business Review, Surviving Disruption (HBR December 2012), he proposes a systematic assessment of five kinds of barriers to disruption. They provide an insightful analytic tool.

Type of barrier to disruption	Definition	Publishing relevance to e-book disruption
Momentum barrier	Comfortable with status quo	Status quo is gone
Technology implementation barrier	Needed technology available but not yet implemented	Rapid consumer adoption
Ecosystem barrier	Requires change in business environment	Ecosystem changing rapidly
New technologies barrier	Needed technology does |not yet exist	Web sales and devices meet consumer content requirements
Business model barrier	Disrupter has to adopt company cost model	Publishers adopt the iTunes business model (agency pricing)

Figure 3. Source: **T. Cooper/The Consulting Garage 2013**

In the West, e-book adoption is now proceeding rapidly. But it's taken 10 years to clear all the barriers.

Publishers now find themselves in a comparable position when it comes to print supply chain strategies. A new generation of digital print technology is available and starting to be implemented by leading-edge printers across the globe. To move forward, publishers must tackle the prevailing "business model" of print supply chains, and adopt a new and better approach to use going forward. As they advance, publishers will find the other barriers to be breakable. Fortunately, all the concepts and tools that publishers need are ready and waiting to be used to scale each successive barrier.

Hybrid market driving hybrid book publishing supply chains: present & future

“Transformation A should reposition the core business model to the altered marketplace. Transformation B should create a separate disruptive business to develop the innovations that will become the source of future growth.”

– Two Routes to Resilience”, Harvard Business Review, December 2012

Further on in the Harvard Business Review issue, Gilbert, Eyring and Foster present a senior management approach for strategic transformation during disruption that fits the current book publishing environment. Describing major transformations as requiring two different efforts working in parallel, the authors recommend a dual-track organizational structure. Since most publishers now regularly equate the core business model (transformation A) to print and the disruptive business model (transformation B) to e-books/digital, it is easy to see the application.

The current reality is that a hybrid market for books has developed in which readers buy both print and e-books (Verso Digital’s 2011 Survey of Book-Buying Behavior). Hybrid markets also mean that publishers must manage two distinct supply chains: one for books and another for e-books. While some booksellers are the same for both supply chains (e.g., Amazon.com, Barnes & Noble, etc. in the US), the links (or nodes) in the chain are different for both publishers and booksellers. What used to be a 1-to-1 supply chain relationship (pictured below) is now a 2-to-2 business relationship.

Supply Chain Management Scope

- Supplier Selection and Management
- Procurement Process
- Demand Forecasting
- Inventory Management
- Distribution Network Management & DCs
- Logistics Planning
- Transportation

Publisher`s print book supply chain standard model (20th century) is in disruption

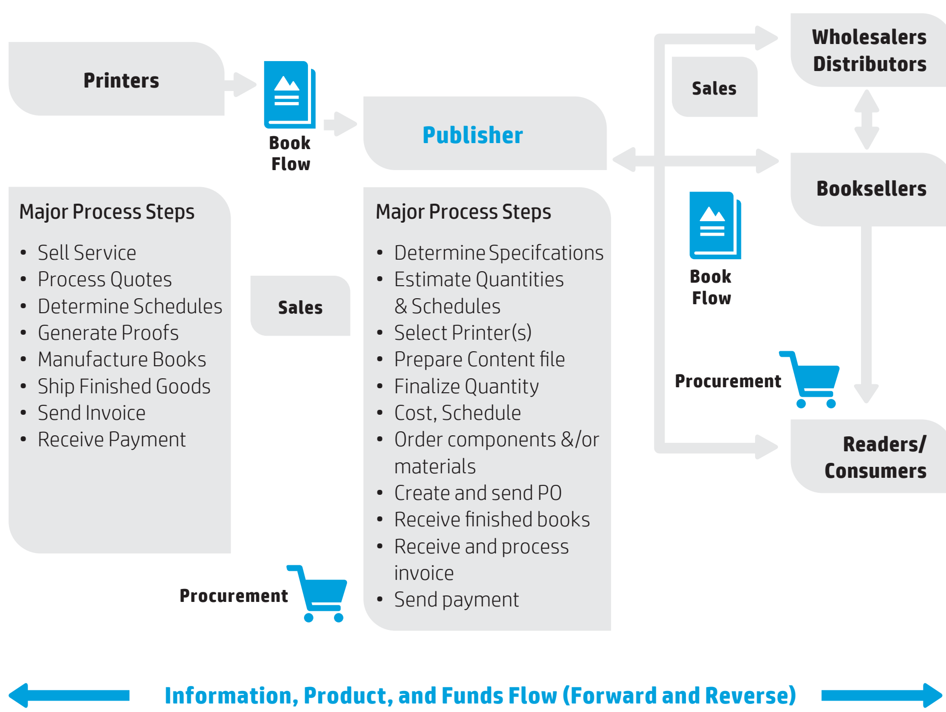


Figure 4. Source: **T. Cooper/The Consulting Garage 2013**

Another dimension to understanding the e-book disruption’s impact is to understand the underlying assumptions that led to the evolution of the current supply chain as pictured above. Whether it was intended to be the case or not, the prevailing “business model” assumption for publishers has been to pursue lower unit costs and drive economies of scale. However, publishers must now adopt a new approach.

Rethinking the primacy of the unit cost

To generalize, trade print book publishing in the US was built on a physical retail/physical media business model where economies of scale drove financial success. One of the most obvious and important economies of scale for print existed in traditional offset printing. Industry standard cost accounting further amplified this economy of scale by amortizing the cost of press set-up (a major fixed transaction cost) across the number of books printed, embedding both the fixed set-up cost and variable run length cost within the "unit cost". Since the unit cost was one of the key elements used for a title's financial analysis and was readily controlled by adjusting the quantity printed, the net result usually drove publishers toward larger print runs and therefore lower unit costs.

As a result, other critical cost factors were not given the priority attention they deserved. The fact that increasing the size of a print run increased the total amount spent for the printing was not a primary concern for most publishers; nor was the risk of these higher print quantities increasing excess inventory typically seen as outweighing the advantages of lower unit costs. Indeed, uncertainty about sales forecasts, combined with the quick P&L advantage of a lower unit cost, made having "enough" inventory of books "just-in-case" a publisher's primary concern.

While the print retail ecosystem was growing, the unit cost focus was reinforced by aggressive sales and marketing tactics that required cheap and plentiful inventory. Publishers found that the in-store discoverability of print books was maximized when a title's cover/jacket was prominently displayed. In other words, when books were "faced out" or stacked on a table, they had their best chance of being sold to a browsing consumer. Most trade publishing operations evolved to focus on that opportunity, as jacket design and copy became critical elements to success, complementing larger order quantities to support the stackable scenario.

Physical supply chains for publishers, therefore, evolved over time to maximize the merchandising opportunities presented by filling larger orders, particularly initial orders, placed by booksellers. For example, the final Harry Potter book, Harry Potter and the Deathly Hallows, published in 2007, was the peak of this model. Over 5 million print copies (out of the 12 million copies in the first printing) were sold on the on-sale date. From the perspective of 2013, we would in contrast anticipate huge e-book sales and significantly less print books to be sold. Print out-of-stocks would be buffered by the ready availability of the e-book.

Today, the rise of e-commerce elevates the role of metadata, replacing a reader's physical shelf encounter with a keyword-driven webpage view. At this point, the trend in the growth of online transactions is so rapid that experts believe within five years 80% of all US trade publishing revenue will be generated online, whether sold as e-books or print books. While this conversion will challenge the brick-and-mortar booksellers and increase the leverage of e-commerce giants like Amazon.com, the good news for publishers is that the efficiency of e-commerce enables lower inventories by helping reduce returns of unsold yet distributed books and should lead to smaller printings through a title's lifecycle.

Major change in trade print book business	**Supply chain implication**
E-commerce share of print books growing	Less inventory devoted to merchandising stacks
Retail initial orders are smaller	Smaller 1st print runs, fewer returns, less excess
Backlist print sales shrinking	Smaller reprint quantities, fewer returns
Number of traditional outlets shrinking	New sales in non-traditional channels

Figure 5. Source: **T. Cooper/The Consulting Garage 2013**

Rather than needing a stack of books for display at every brick-and-mortar outlet, e-commerce orders ship from a central inventory located in a small network of distribution centers (DCs). Going even further, Amazon.com and Ingram Book Company offer growing print-on-demand services where printing happens in their DCs, either replacing the need for an offset print run or supplementing a publisher's own inventory when the traditional warehousing methods result in out-of-stocks at the DC in question.

These trends generally apply to all publishers as the Internet continues to change how business is done. As publishers learn to manage this changing retail environment, the pursuit of lower unit costs driven by economies of scale becomes more difficult. The print book supply chain must be managed with the realities of an altered marketplace shaping new assumptions going forward.

Re-engineering the print supply chain focus from unit cost to total cost: a personal perspective

As a senior publishing executive, I learned that there were many drivers of supply chain advantage, with inventory management as the key. Managing inventory has long been a persistent problem for all publishers. During my more than 20-year career, I was part of many corporate initiatives aimed at reducing physical inventories. Often the path forward to improvement was not new, nor was it unproven. The same holds true as much today as it did then. Yet the way forward is—more often than not—counterintuitive to many experienced publishing staffers.

> Ordering less quantity, and therefore paying a higher unit cost, can be less expensive if you measure the **total cost of ownership** (TCO) of inventory. Why? TCO factors in the risk that a portion of what's ordered will become excess inventory and either sold at a fraction of the unit cost or destroyed.
>
> – T. Cooper/The Consulting Garage 2012

TCO accounts for both the capital cost of inventory (i.e., what else could you do with the money rather than pay for a print run of inventory for uncertain future demand?), and the non-capital cost including storage space (warehouse, returns processing), risk costs (obsolescence, damage, shrinkage) and service costs (insurance, taxes on inventory), in addition to the unit cost.

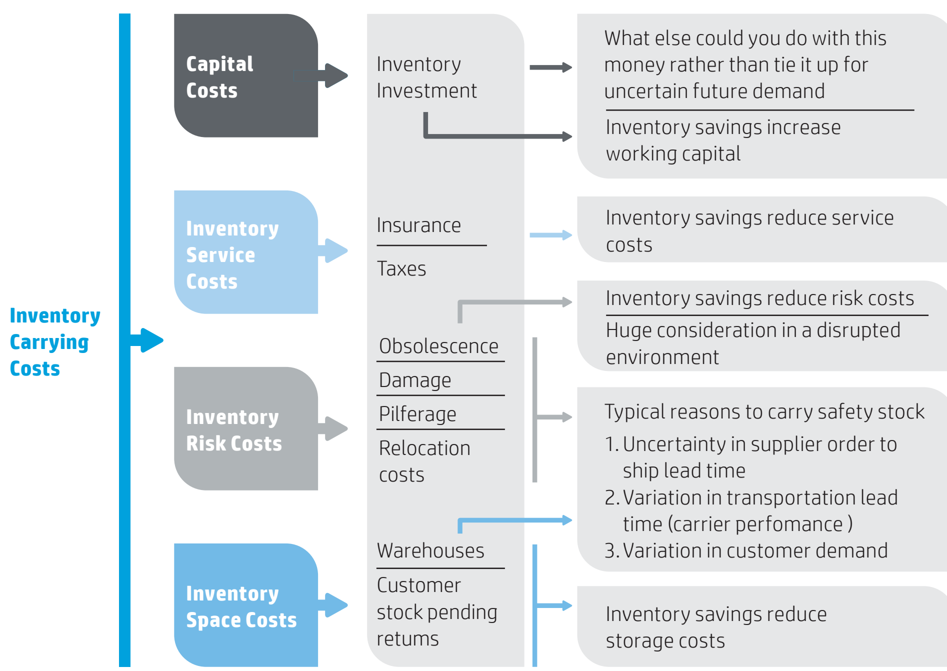


Figure 6. Source: **Capital and Non-Capital Components of TCO "Lean Six Sigma Logistics", Goldsby & Martichenko, p. 24**

When TCO is used rather than just unit cost, inventory quantity decisions change dramatically. The simplest illustration of the impact of TCO is a story I call "when 2 = 1."

In 2003, I was part of a project team tasked with calculating TCO for our company. We identified capital cost plus non-capital cost to be approximately $1.00 per unit per year. So a book that had a unit cost of $1.00 had a TCO of $1.50 after being in stock (i.e., available in the warehouse or DC) for 1 year (averaging out the cost), and a TCO of $2.50 after 2 years. The question one asked was why would a $2.00 unit cost to print 1 year's supply of a title be chosen versus paying $1.00 unit cost for 2 years supply? But when analyzed using the TCO principle, it was apparent that the costs were actually equal. So the answer was to order less quantity and further reduce the risk of excess inventory and eventual destruction orders.

Unit cost-centric print publishers must get lean

Print book supply chains must become lean. Lean is the logistics model of the e-commerce age, and is deeply rooted in the concepts of the Toyota Production System. In its purest form, lean is about the elimination of waste (excess inventory) and the increase of process speed and flow. Using the example of e-commerce, shipping directly from a DC eliminates several layers of redistribution. This in turn reduces the bullwhip effect that distorts the demand signals through each layer of ordering. If the demand signal is clearer, publishers can more effectively anticipate or respond to sales patterns without needing excess inventory.

In the past, publishers printed a large quantity at once, and then shipped units to a central warehouse for storage until orders were received. A single trade book in the US could be shipped and handled through four or five different links in the supply chain to reach the reader (see figure 7, below). Even outside of trade, most publishing distribution channels had sequential redistribution that created large buffers of inventory.

Publisher's Print Book Supply Sequence

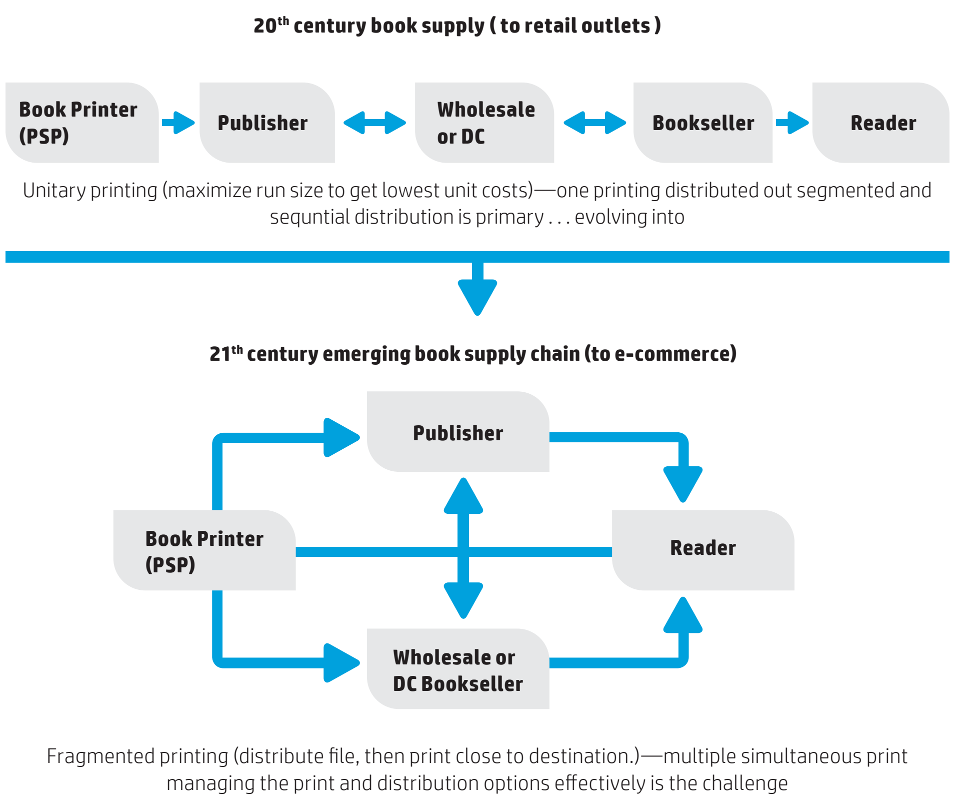


Figure 7. **Source: T. Cooper/The Consulting Garage 2012**

While the examples used to illustrate TCO concepts are primarily trade publishing, it is the case that all unit cost-centric print book publishers must re-position their supply chains around minimizing TCO. Implementing this approach will mean that the average inventory carried on an item is less, but that the item is reprinted more frequently. Legacy publishing staff may find this cycle counterintuitive to their long-reinforced unit cost instincts. Smaller order volumes also require publishers to automate order placement using EDI and automated replenishment models based on inventory turn goals and order flow rates. This will have positive ripple effects, allowing the chain to be leaner as systems and processes align to enable increased transactional volume, while using less inventory overall to achieve the same level of sales.

Publishers will need to work through several operational transitions. TCO-driven inventory management will require publishers' warehouses to become more DC-like, with systems, processes and facilities that can support a transaction-heavy flow environment. What used to be large buffers of inventory (sometimes multiple years of supply) in deep storage must now be reduced, with more accurately modeled printings that tend to be more frequent and of smaller sizes. Less storage space, more frequent restocks, smaller inbound loads, direct and/or bindery shipments—these are examples of how warehouses must function as hubs for increased activity. Some publishers who are still operating independent warehouses may even consider moving to a distributor that can meet the requirements.

Print in the 21st century: digital print is a latent disruption waiting to occur

Fortunately for publishers, a latent disruption (still caught in the technology implementation barrier) is well positioned to help reconfigure the print book supply chain. Early indicators show that while print book volumes have declined, the number and share of pages printed digitally is growing significantly (see figure 8, below), while analog (offset printing) declines precipitously.

Print book pages

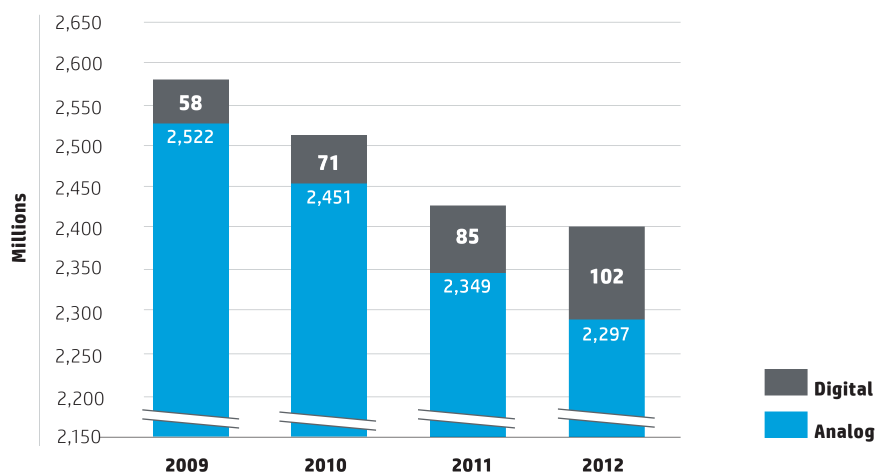


Figure 8. **Source: HP**

Digital printing is the disruptive technology waiting to be fully implemented by printers and publishers alike. By 2017, digital printing is expected to account for almost 22% of print books, compared with only 7% in 2012. This revolution is being driven by a combination of inkjet web presses that provide high-volume digital production solutions for most mainstream book applications, and liquid electro-ink digital presses that provide offset matching print quality on a broad range of coated and uncoated paper stocks for high-end color books.

As brought to market by Hewlett Packard and other companies, the current generation of digital presses have the scale, speed and quality (in multiple colors) to compete with offset on many print run sizes, across all book types and categories. These new generations of digital presses enable publishers and printers alike to create newly profitable business models such as web-enabled, classroom-specific, custom college course books, or personalized children's books. Titles can be printed in page order on integrated production lines, going from paper to a finished book in under five minutes. Many innovative uses of the customization/personalization capabilities of this platform will be driven by publisher ideas.

By helping drive digital press implementation in the industry, publishers can break barriers, push aside the status quo and finally seek print solutions that offer low-TCO answers. But general concepts cannot address each publisher's own business and cost models. The lowest-TCO solution has to be applied to the specifics of each business to simulate its financial opportunity.

The key role of book printers in the re-engineered supply chain

Executing new inventory management and supply chain strategies requires book printers who are committed to handling 21st century business. Printers are experiencing their own flavor of disruption. As a result, consolidation in the US, for example, has reduced the number of competitors in the space, and soft demand keeps offset prices low and still likely to fall further. Like publishers, book printers' growth prospects are limited if they continue with a traditional offset approach. They have to offer flexible value-added services that solve the needs of today's publishers.

Clearly, printers need to have a robust digital print capacity that is flexible enough to handle many categories of books. Color capacity is key for many publishers with diverse imprints. As more print backlist titles move towards being considered "long tail", print-on-demand (POD)and auto-replenishment (AR) services (combined with direct fulfillment) will comprise a larger piece of the pie. Additionally, publishers and their printing partners may need to utilize distributed print networks to enable printing closer to where the book is needed, saving shipping time and costs.

Additionally, given shrinking print revenues, publishers are challenged to financially support the staff and systems required to manage the print side of the business. This could open the door to cost-justified investments supporting more automated, streamlined transactions between printers and publishers using XML. The pressure to reduce staff costs could lead to mutually advantageous transfers of staff and functional duties from publishers to printers. Whether this shift takes the form of limited business process outsourcing or more comprehensive vendor-managed inventory programs, it is clear that there are opportunities for creative solutions.

But one of the key market-moving decisions that printers must make is how to price digital. While the soft market for offset becomes break-even or even a loss-leader for printers, digital is still growing. Attractive pricing for publishers lowers cost barriers while raising the break-even point versus offset. The ultimate profitability/volume of digital print for books may rest on the amount of automation the book supply chain can enable. The higher the level of automation used for routine transactions, the more the costs will fall for all of the players. Current low costs for digital print could help publishers decide to allocate financial resources for internal systems investment in workflow automation. Low TCO enabled by digital will help publishers pay for the investment, as evidenced in the next case study.

Overcoming barriers in digital print: a personal perspective & case study

When I was just settling in at Harcourt Trade Publishers, I was invited to join my first corporate initiative to better manage inventory. Those early meetings triggered a series of events that led to Harcourt Education forming a corporate supply chain team. One of the early leaders in supply chain was Clarence Thacker, then the Inventory and Manufacturing Director of the K-6 School Division. Clarence and I ended up working together on supply chain projects, and 10 years ago we were involved in an attempt to break the barriers to implementing color digital print bookmaking.

Clarence had an ongoing challenge: when publishers like Harcourt submitted their textbook programs to states for adoption consideration, only 100 copies of each textbook were required. Teacher's Editions (TEs) of textbooks, which were one of the last submission components to have their content ready, needed the full textbook content as well as the additional teacher-specific materials. This meant that TEs prepared for submission had no other use: coming correction cycles would render the originals unusable. But to get the 100 copies needed in those days, offset printing was the only choice. Since TEs had larger trim sizes, higher-page count, and were case-bound, they were expensive to produce under the best of circumstances. The minimum offset order for each TE was 1,000 copies. For one particular submission, there were a total of 23 TE titles in the program. This meant that 1,000 copies of each were printed, with 90% (or 900 copies per title) as excess. The paper and press make ready cost was approximately $25,000 per title, with a run rate (for the minimum of 1,000 copies) of approximately $15.00 per unit as follows:

Production quantity	Make ready cost	Run rate for 1,000 copies	Total printing cost/ unit cost	Cost of excess printed inventory
1 TE title	$25,000	$15,000	$40,000 or $40/unit	$36,000 (90%)
23 TEs in program	$575,000	$345,000	$920,000 or $40 per unit printed, but **$400/unit needed**	$828,000 (90%)

Figure 9. Source: **T. Cooper/The Consulting Garage 2013**

Clarence and I took this case and presented it with examples of TEs to book printers, as well as to their suppliers: Hewlett Packard, Xerox, and others. We argued for a color digital print solution that could address this terrible scenario. After several years of consistent effort and outreach about the problem, we were able to transition submission of TEs from offset to digital, printing TEs as needed for below $100/unit, saving Harcourt hundreds of thousands of dollars for each submitted TE.

Type of barrier to disruption	Explanation	Case study relevance
Momentum barrier	Publishers used to status quo	Status quo was very expensive
Tech implementation barrie	Needed technology available but not yet implemented	Latest generation of color digital equipment was ready for deployment
Ecosystem barrier	Requires change in business environment	Had to get publisher and customer to accept digital print quality
New technologies barrier	Needed technology does not yet exist	Timing was optimum given business objectives
Business model barrier	Disrupter has to adopt company cost model	Calculated the target unit cost on copies ***needed, not printed***

Figure 10. Source: **T. Cooper/The Consulting Garage 2013**

If Clarence and I can break barriers, you can too. Start with sharing your situation with book printers.

Conclusion: getting started on re-engineering your print supply chain

Ready to start re-engineering your own supply chain? The table below illustrates how fundamental the changes will be. Understanding that your publishing company should expect more reprint transactions on declining print sales is important, and will encourage executives to invest in more system and process automation: one-time major investments that will decrease ongoing expenses and enable low-TCO inventory management. From clarifying TCO for your company to properly aligning staff incentives towards minimizing TCO rather than unit cost, much work needs to be done.

20th century print supply chain characteristics	21st century emerging characteristics
Reprints high-touch, low-frequency	Publishers used to status quo
Run-on (unit cost) mentality–print, then distribute	Needed technology available but not yet implemented
Maximize gross unit sales for merchandising	Requires change in business environment
Multiple levels of inventory across the chain	Needed technology that does not yet exist
Supply chain function	**Re-engineering goal**
Supply chain management	Dynamic measurement of order flow and production requirements
Inventory management/policy	Match production rates to inventory turn goals
Analysis and decision making	Automatic ordering and exception reporting
Manufacturing/purchasing	Optimized transaction management; cycle time and price of books sold, not bought
Supplier management	Publisher/supplier integration process for high frequency ordering
Metrics and measurements	Establish metrics and control methods to optimize TCO

Figure 11. Source: **T. Cooper/The Consulting Garage 2013**

At this stage most publishing executives would want to understand how adopting a low-TCO print approach would improve their current results. Around the world, printers and publishers are implementing change that brings growth and profitability to their businesses. For publishers reading this paper, your future starts now. A first step is to participate in Hewlett Packard's courtesy program of business transformation for publisher's supply chain management.

Step One: HP's business transformation for book publishing and SmartBooks model

Many publishers do not have a handy tool to show "what-if" inventory/supply chain scenarios. Likewise, many do not have a tool that can help simulate the return on investment of re-engineering the print supply chain. However, HP has developed a new simulation model called SmartBooks. Based on a cash management model with weekly options, SmartBooks can help publishers with those tasks and much more.

The SmartBooks toolkit processes a set of input parameters describing a publisher's business (i.e., margin, costs, returns rate, royalty and inventory reserve rates, etc.), and a set of title-specific parameters (price, unit and other costs, sales over two years, etc.) and provides a sensitivity analysis of different inventory management (or print quantity) scenarios on the same rate of sales over time: one with costs produced by the offset (analog) traditional approach; a second by a hybrid of digital and offset and a third that is purely digital. While the model crunches data at a title level, it is able to generate a representative set of "generic" titles for an imprint or a publisher.

Aggregating the sum of the "generic" titles then simulates the specific financial impact of each print approach to your publishing house, with the best approach for the title delivering the desired results: reduced inventory, reduced cash requirements, increased profitability and low-TCO. The flexibility of this process allows a publisher to simulate a variety of scenarios appropriate to many different types of titles, imprints, book specifications and demand profiles.

Results are delivered graphically (see figure 12) as well as in a traditional financial format.

HP SmartBooks toolkit

A book publishing simulation model

Figure 12. Source: **HP SmartBooks 2013**

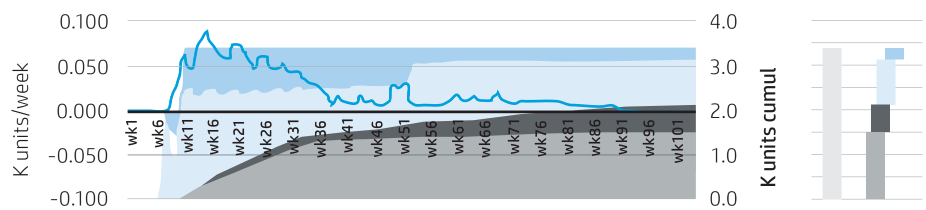
Example case specifications:

- $ 50 STM book
- Hardcover
- 250x290mm
- 240 pages, most in full color
- 90gsm coated

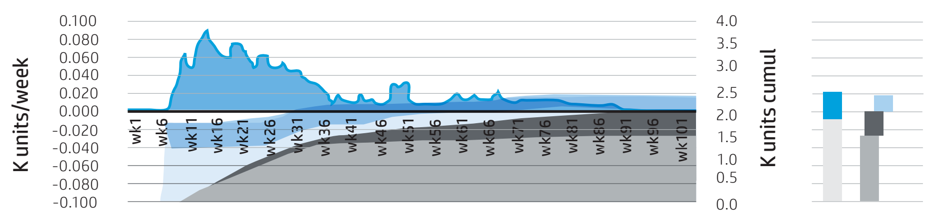
Sell through of 2000 copies in 2 years, 20% sold via e-store 80% through retail.

- Top: Two print runs in offset. About 1200 units left unsold, including returns.
- Bottom: In a hybrid mode, 1st print in offset, then sub-sequentially ARP with digital print. Minimal stock left at retail point only. Minimal Returns.

Offset only



Offset first, then digital

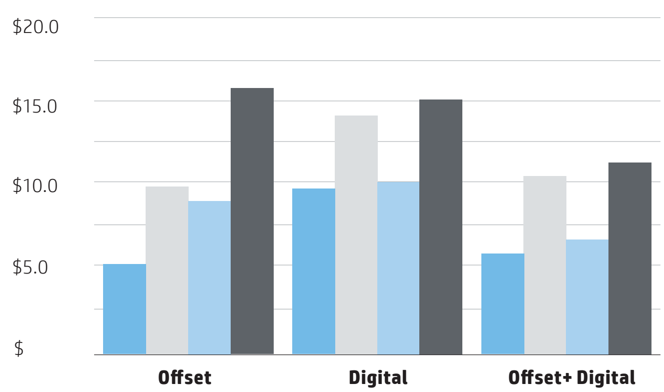


- Channel stock, in K units
- central stock, in K units
- Cumul. sell-out e-store in K units
- Cumul. sell-out retail, in K units
- Effective demand, in K units/wk

- Produced digital
- Produced offset
- Central stock
- Channel stock
- Amount sold-out e-store
- Amount sold-out retail

TCO per book after 2 years

Manufacturing cost per book is one thing. Adding costs like warehousing, distribution, pulping gives a "total-cost-of-ownership". Then consider sell-through and judge offset vs digital based on TCO per unit sold.

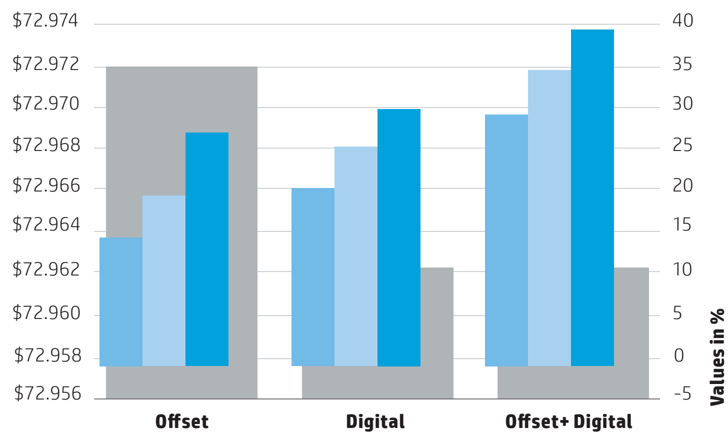


- mfg cost / unit produced
- "TCO" cost / unit produced
- mfg cost / unit sold
- "TCO" cost / unit sold

Financials after 2 years

Revenue from book sales, set against operational and financial costs, to deliver cycle profit, cash-flow and remaining inventory value.

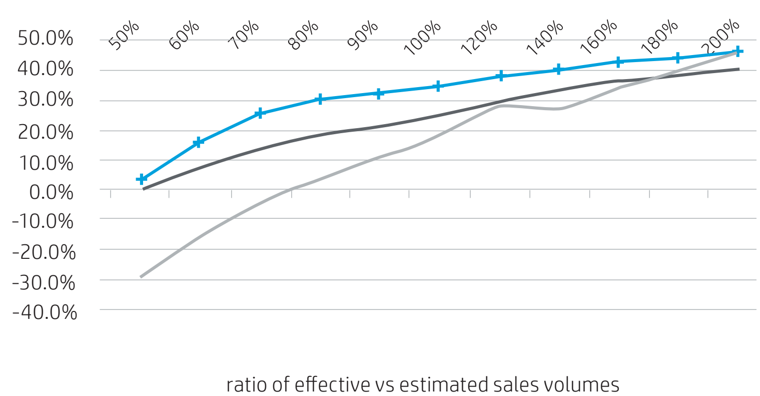
- Net Operating cashflow / Revenues
- Net Profit / Revenues
- Op Profit / Revenues
- Total Revenues



Net Profit %, in function of effective demand

A sensitivity assessment demonstrates how profit is impacted by deviations from forecasted sales volume. Look at how digital reduces the financial risk of book publishing, yet captures all upselling opportunities.

- Offset first and then digital
- Offset
- Digital only



In figure 12 based on the company and title input parameters provided, SmartBooks calculates results that show the “offset + digital” scenario to be the most profitable, and with the lowest TCO.

Summary

If the concept of TCO is new to you, then the theories and the model presented in this white paper can serve as the starting point for conversations within your organization. If your company is in the early stages of re-engineering, then TCO and the model can help validate the work you've done and point to additional opportunities. If your organization is well advanced in implementing a low-TCO approach for your print book supply chain, then the model can serve as yet another check of your own calculations.

Re-engineering isn't easy, even when the business case is strong and disruption is forcing your hand in a changing industry. There is a wealth of reference material available for review, including the seminal texts by Michael Hammer, who calls re-engineering "the fundamental rethinking and radical redesign of business processes to bring about dramatic improvements in performance."

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