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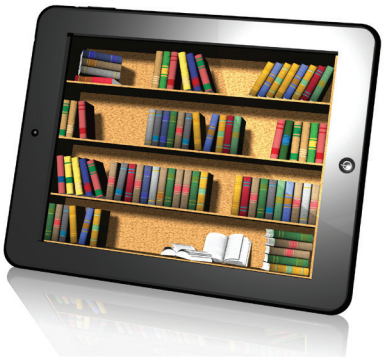
The impact of digital publishing models on print, reprint and profitability forecasting



As part of the discussion surrounding stock cover and planning for specific target groups, Steve Waldron, Vice President of Business Development for Klopotek North America, describes the combined application of individual formulae in tables with database information from PPM.

In many publishing houses today, the growth of e-book sales and other digital distribution channels for content has lead to the need to change the whole cost infrastructure of their organizations. The effect on the cost basis of traditional distribution centers and so on is obvious. It also follows that the production costs of producing the various formats of products published have also radically changed.

However, even though digital distribution and the leveraging of content with new digital models are growing, there is still a need to provide traditional printed products to those who prefer to pay for them. Large volume trade or mass market publishing still requires print run planning and reprint forecasting.

So, how can you change your forecast models so that the cost effects of reducing print run quantities to match the demand can be analyzed and better understood while also understanding the cost and profit effect of digital distribution models? How do you calculate the most economical way to provide the required e-book formats and printed inventory?

Happily, there is a new force in computing that can help, Thomas Bayes, even though he has been dead for hundreds of years.

Bayesian theory already affects your everyday life. Software giants such as Google and Microsoft employ Bayesian theory in their software today to provide likely but never exact results to data searches (we have all seen the "did you mean" question) or to predict the next action a user will take when operating software tools to improve performance and user friendliness. Using the theory is also fundamental to current research in artificial intelligence and robotics.

Bayes' Theorem

$$P(H \mid E, c) = \frac{P(H \mid c)\ \ P(E \mid H, c)}{P(E \mid c)}$$

Despite the esoteric symbols, the idea – roughly speaking – is simple: The likelihood that something will happen can be plausibly estimated by how often it occurred in the past. Researchers are applying the idea to everything from gene studies to filtering e-mail. Source: http://news.cnet.com/2009-1001-984695.html

Sales forecast, inventory planning and profitability analysis in modern planning systems can also use this theory to provide publishers with predictive and accurate planning models to effectively support the transition from print to digital, while still maintaining the profitability of publishing content in any form or forms, no matter how complex.

In the same way that Google and others provide this kind of intelligence, Klopotek PPM (Product Planning and Management system) can use past sales, returns and profitability performance to apply Bayesian theory to accurately predict the future sales in the respective e-book channels, digital distribution channels, POD (Print on demand) and traditional print channels. Knowing the likely volumes of product formats in each sales channel allows for the ability to research the most cost effective way to manufacture product to support those channels and therefore increases or maximizes product profitability and helps to re-engineer the infrastructure costs of the publishing house.

Klopotek PPM achieves this using OLE automation and MS Excel™ integration or using the XML data export providing the ability to apply any complex formulae desired, such as Bayes' Theorem, to rich metadata on product, sales and formats.

So, how does this theory work in a practical sense? Suppose there are two packets of candies. Packet 1 has 10 cherry candies and 30 chocolate candies, while packet 2 has 20 of each. Our friend and candy lover, Joachim, picks a packet at random, and then picks a candy at random. We may assume there is no reason to believe Joachim treats one packet differently from another, likewise for the candies.

The candy Joachim picks turns out to be a chocolate one. How probable is it that Joachim picked it out of packet 1?

Intuitively, it seems clear that the answer should be more than a half, since there are more chocolate candies in packet 1.

The precise answer is given by Bayes' theorem. Let H_1 correspond to packet 1, and H_2 to packet 2. It is given that the packets are identical from Joachims's point of view, thus $P(H_1) = P(H_2)$, and the two must add up to 1, so both are equal to 0.5. The event E is the observation of a chocolate candy. From the contents of the packets, we know that: $P(E \mid H_1) = 30/40 = 0.75$ and $P(E \mid H_2) = 20/40 = 0.5$.

Bayes' formula then yields

$$P(H_1 \mid E) = \frac{P(E \mid H_1)\,P(H_1)}{P(E \mid H_1)\,P(H_1) + P(E \mid H_2)\,P(H_2)}$$

$$= \frac{0.75 \text{ x } 0.5}{0.75 \text{ x } 0.5 + 0.5 \text{ x } 0.5}$$

$$= 0.6$$

Before we observed the candy selected, the probability we assigned for Joachim having chosen packet 1 was the prior probability, $P(H_1)$, which was 0.5. After observing the candy selected, we must revise the probability to $P(H_1 \mid E)$, which is 0.6.

If we apply the same theory to the wrappers and packets that Joachim discards we can also predict his preference for cherry or chocolate.

In the same way it's possible to predict the sales volume of e-books or print sales or POD sales in any particular format in any particular sales channel by applying the theorem to the previously observed sales volumes and profit performance; e-books could be considered candies and the sales channels the packets, and returns allow us to predict preference, to put it simply. There are several interpretations of the theory and different ways to apply the inference, however, the accuracy of the predictions is quite impressive and it's extremely dynamic and improves over time.

Having established better predictions it's then possible to assess the probable sales volumes of the various formats of product in the various sales channels needed to support and therefore negotiate and research the most economical order quantity to support the anticipated volumes.

Having secured the best cost models possible it's possible, then, to better predict the profitability and break even volumes needed to support the decision to publish works. The whole process is not static and the more it is used the more accurate it becomes.

For any additional information please contact Steve Waldron, VP Business Development, s.waldron@klopotek.com

	PPM	Calculation	Alternative	Notes on production
Price	14.99	1	Price	
Total sales	205000	1	Sales	
Total average costs	860426	1	Average costs	

$$P(A|B) = \frac{P(B|A)\,P(A)}{P(B)}.$$

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Show distrbution channel name | PPM | FALSE

Sales estimates | Calculation | ALL

Distribution channel	Sales #	Returns #	Net sales #		Total	Total %	Sales #
ALL	0	0	0		0	0.0%	0
iBook	90,000	0	0		0	0.0%	0
Kindle	50,000	0	0		0	0.0%	0
Nook	25,000	0	0		0	0.0%	0
EPUB	2,500	0	0		0	0.0%	0
POD	5,500	500	0		0	0.0%	0
Print	32,000	3,560	0		0	0.0%	0
Other	0	0	0		0	0.0%	0
WEB	0	0	0		0	0.0%	0
CUST	0	0	0		0	0.0%	0
ORWO	0	0	0		0	0.0%	0
AFFO	0	0	0		0	0.0%	0
EDU	0	0	0		0	0.0%	0
LIB	0	0	0		0	0.0%	0
PORT	0	0	0		0	0.0%	0
Total	**205,000**	**4,060**	**0**		**0**	**0.0%**	**0**

Average costs

			Cost type				
Distribution channel	Total costs	% of sales		% of costs			Total costs
ALL	0.00	0.0%			0.00	0.0%	0.00

Example: Klopotek PPM forecast calculation