Interview with Sandeep Malhotra, Head of the Vertical Solutions Group in HCL Technologies—Supply-chain strategies for the publishing industry

Sandeep Malhotra

heads the Vertical Solutions Group for Publishing, Education and eLearning and has more than 12 years of experience in the industry and has been working for the past five years with world's leading publishers in Education, Trade, STM and LTR spaces. He has been instrumental in devising content, rights/royalty, assessment/testing, digital assessment management and rich media business, strategy and technology solutions. Sandeep, as an evangelist is responsible for concept to implementation of Content 2.0 solutions covering the Book, Newspaper and Magazine Publishing at HCL. Sandeep's focus area is editorial process optimization and network publishing.

Keywords: *publishing supply chain, mass customization, micro-billing, artificial intelligence, social networking*

Abstract We spoke to Sandeep Malhotra of HCL Technologies on the current state and evolution of the publishing supply chain, with some input from Subhankar Bhattacharya, also of HCL.

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MM: Let's start with a round of introductions. Subhankar, would you like to start?

SB: Yes. Hi. This is Subhankar Bhattacharya. I'm a principal with the media and entertainment practice of HCL and I'm responsible for shaping market solutions for HCL. At the current moment I am spearheading the SOA-based digital media supply chain framework "IMPACT" that will facilitate companies optimize their investments on digital media and ensure faster go to market for new services. I have more than 12 years of experience in this industry. That's my brief background. Over to you Sandeep.

SM: Hi. I'm Sandeep Malhotra. I have been working in this industry for over 12 years as well and I am the head of the Vertical Solutions Group (VSG) in HCL Technologies. I oversee the Publishing micro-vertical and am responsible for concept to implementation of HCL's Content 2.0 Network Publishing Platform covering book, newspaper and magazine publishing.

MM: Excellent.

Would you like to give a brief overview of the business of HCL?

SM: Yes. Just to give you a brief background of HCL as a company. HCL has been in business for over 30 years. Its total revenue is around 4.7 billion, as we speak today.

MM: 4.7bn dollars?

SM: Yes. 4.7bn dollars and more than 53,000 people. We operate in 18 countries, worldwide.

We're very proud of our history. HCL was founded in 1976 and we have a very strong foundation in product engineering. In 1978, we built a 16-bit processor and a microcomputer — at the same time Apple came up with its microcomputer. That's the kind of information that people are probably not aware of.

HCL actually has two companies. One is HCL Infosystems, which is a hardware and systems integration company, focused primarily on India and Asia-Pacific markets. Then we have HCL Technologies, which is one of India's leading global IT services companies, providing software-led IT solutions, remote infrastructure management services and BPO.

HCL Technologies was incubated from HCL's R&D organization. It has a strong heritage in product engineering with significant growth in

Sandeep Malhotra
Vertical Solutions Group
— Publishing,
HCL Technologies,
Plot 1 & 2, Sector 125,
Maple Towers,
Noida-Greater Noida
Expressway,
Noida (UP) 201301, India
Tel: +91 120 4046343
Fax: +91 120 4258946
E-mail: sandeepm@hcl.in

services and application businesses over last eight years of operations. That's a brief overview of the company.

In 1986, we became the largest IT company in India. We had fostered several alliances with companies including Hewlett Packard and Perot Systems.

MM: Excellent.

SM: We probably would like to start with publishing services, if you are okay with that.

MM: I'd like to start with your take on essentially the state of — and/or — evolution of the media supply chain or the publishing supply chain. And in your view of that, just highlight some of the key developments and forward-looking trends you see in those particular supply chains and their transformation into digital supply chains.

Out of that, then we can focus on a particular area. For example, print operations or publishing operations. Specifically, how do they become centers of excellence within an integrated end-to-end industry supply chain?

Does that sound like a good place to start?

SM: Yes. Absolutely. Our presentation is divided between the publishing side and the marketing side. Is it okay to go ahead with that?

MM: Let's do the publishing first. The publishing supply chain or the publishing industry. Then let's also address in the second half of our conversation here, the marketing supply chain.

SM: Sure.

If you look at the traditional publishing supply chain, either in book, newspaper or magazine publishing, it really starts off with planning a project.

Speaking in the context of book publishing, it starts off with title planning, market research, demand forecast, sales projection, possible authors, etc which involves a lot of analysis and hypothesis around who the author is and what are we trying to publish. Under which imprints should we take it to publication? What kind of revenue will it generate? What is an appropriate advance, ongoing royalties, etc. What are the costs of manuscript acquisition, production and hence, what's the business case to take a particular publication?

Once a business case is established, the author is hired to write a manuscript or efforts are made to acquire pre-written content.

Simultaneously, teams work on marketing copy, a cover page, production planning, designs finalization, graphics, layout, so on and so forth. Multiple stakeholders like designers, artists and editors are involved in a collaborative fashion. Once the content is ready, compositors work to come up with the first copy of book. Editors review that copy and then you draw a mass-production plan, which essentially means you will determine which geography, which segment and which type of customers you'll target. This is also when you'll determine how many copies should be printed to take to market.

While that production is being done, you start coordinating the campaign, socializing at book fairs and/or create pre-launch awareness. After the book is printed, you launch the title in several markets.

From there, when the first copy is almost getting ready, you start taking up the sales and marketing process, which involves reaching out to the professors so they'll make recommendations to the students, or reaching out to schools to encourage the book to be considered as part of statewide adoption of a particular curriculum.

Once the books are printed, you can sell them to both retail and corporate consumers via physical ordering and online sales through portals, IVR or customer services divisions. After the order has been fulfilled, the book is shipped from the warehouse to the customer — either a large bookstore or a school depository, etc — and the customer makes the payment. When the payment is made, there's a post-sale process of managing the customer relationship. With every sale of the book, you end up paying royalties to the authors.

That's the typical value chain of traditional book publishing. But the industry and process is seeing huge transformation. Within the print space, the digital supply and the aspect of digital is coming in very handy. Today people are using technology to automate the interaction and workflows between different stakeholders involved in the book publishing value chain.

Let's say you have authors, editors and compositors. Defining workflow and having content available on that workflow is necessary to create collaborations among these communities. You have authors who can write in a web-based authoring tool. You have editors

who can give their review and comments — and send notification back to authors to give a sense as to what the production plan is going to look like. You can allocate the budget.

Production managers then send them the manuscript and receive composed pages back, and work with the vendors to raise orders. There's a lot of automation that comes into place in the composition process, where people are trying to use the content and have it ingested into a publishing environment such as Quark and InDesign to automate the process and have the printed book available.

At the same time, there is a growing concern now on going digital. People are reading e-books, getting them on their handheld device, seeing them on a learning management platform or even listening to them as digital talking books.

Having said that, there are several transformations happening to the supply chain. Once you have received the content, you want to transform and store it in media neutral format and compose it for various delivery mediums. That's where — especially in the interactive medium — there's a lot of repurposing of content happening with audio, video and animations integrated in the reading experience. Today the platforms on which you deliver content are far more interactive. Now, when people read online, they can actually hear the audio. They can make their own notes, highlight content and save it. They can create custom books. They can have their own personal libraries of books.

That's pretty much what's happening to the book publishing industry.

MM: Excellent summary.

This prompts a couple of questions. We can go back and forth in this, if either of you wants to comment on it.

The first thing I'd like to really address is the changing business model of the publisher — whether you're a book publisher or a magazine publisher or a catalogue publisher. More specifically the books and magazines and/or journals.

Fundamentally, one of the things that we've seen, Sandeep — is that these companies are changing themselves into multimedia platforms. Where they're using technology — digital asset management, XML and other kinds of dynamic

publishing technologies — to create multiple digital revenue streams.

Can you speak to that a little bit?

SM: Sure, Michael. I can do that.

With the advancement of technology, especially broadband and handheld devices, there are far more options available to publishers to monetize their long tail.

They're trying to take old books — back catalogues — that are not available in print today and bring them online. The good news is that they no longer need to maintain an inventory of these books, and take care of their returns. Rather, leveraging the internet is becoming a new revenue model as people are ready to pay a premium for the user experience and ubiquitous access.

A lot of mass-customization and micro-billing is being contemplated. Let's say I want to buy one story. I want to buy one chapter. I want to buy one news item from a particular publication.

The growth of business analytics is allowing the publisher the capability to look at the demographics of particular audiences, set of users or community and align content better matching with the interests of end consumers.

We're really talking about models of mass customization. So I can go ahead and select what I want to read, how I want to read it and when I want to read it. You get that in that same format, in the same content at the time that you want it.

MM: So, Sandeep — let me just break in there a moment.

With the advent of micro-billing, that fundamentally requires that a publisher itemize or break down into the lowest usable chunk, its inventory of content — so as to facilitate, then, buyers or readers buying very specific articles or photographs, or logical collections of content.

So first there's this breaking it down into its atomic form, almost. That then becomes a digital asset management problem where you have to associate rights and permissions and business rules and other sorts of technical parameters in terms of what's in the file, and how to transform it.

Did I get that part right?

SM: You got it absolutely right. There are business decisions and actions that my publishing clients have to take. Questions like: to what extent should we itemize our content? How

much should we markup the product? How much context should we give to the content?

Though it is hard, it is very useful, so people are taking a middle approach. They're not really going ahead and identifying, say each and every paragraph of content. Rather, they're itemizing at page level of a book, and taking it forward.

If there's a newspaper, they're not worrying about looking at every page. Rather, they're looking at each and every logical story together, and trying to construct some very interesting models.

For example, with the advancement in search, when you're trying to look for unstructured content and you've got a story around that — let's say you searched for Levis which returns all the content that contains the keyword Levis. At the same time, you can link that to a lot of structured information on Levis, for example, fact file, product inventory, customers, revenue, growth, so on and so forth.

MM: Sandeep — just in that — just in what you described now — you're describing another set of issues. It kind of went through it, because you do it so well, perhaps. But there's an issue where a lot of companies run into trouble. That is, how can we automate or speed the classification of unstructured content? Whether it's using a dictionary approach or a linguistic approach by which to start to classify and organize seas or oceans of content into logical buckets and other sorts of containers.

SM: Sure. And the people have seen some huge success there, Michael. Specific to HCL, we've noticed that business problem with our customers. What we've invested in is a framework that helps you harvest a lot of information from the web, with its own structure, and apply artificial intelligence-based technology to simulate a vertical search on that content, and get context of that content into a structured fashion, so that you can automate the process of content classification.

Just to give you an example, let's say you're a real estate aggregator. You are crawling websites of newspaper companies and other web property sites. You get a lot of content, but all that content is in different formats. Let's say one newspaper states that I have a five bedroom and another newspaper states the bedrooms are "5." How do you get this content in a single structured format? At HCL we have seen reasonable success in doing the same.

We can simulate a search and try to convert this data into one unified format, and then have it presented. Every house will have five bedrooms instead of the bedrooms are five or some others having bedrooms with a 5.

MM: Moving from the notion of micro-transactions then, it logically leads to itemizing content. Itemization of content then leads to automation strategies for classifying the content. And the classification then leads into other sorts of how to create a unified view of content. Did I get that right, so far?

SM: Absolutely, Michael. The point that you're trying to make here is, "How can you automate the whole taxonomy, indexing and classification processes?" It's more of a challenge for aggregators. It's not really a challenge for a publisher. Especially in the book, magazine and newspaper publishing space.

If you leave the long tail out. But if they want to go through the long tail, yes — it becomes a challenge for them, as well. Especially aggregators. These folks will have a huge challenge of aggregating large content of data. They need automated technologies for managing taxonomy, classifying content and storing that content in intelligent ways.

Then, high-speed search technologies are required to make sure that the content that is retrieved is relevant and involves very limited effort as far as extraction is concerned.

MM: This brings to mind, Sandeep, another pattern that we've seen. One of the macro patterns seems to repeat at least in our research over the last two years. That is, technology — when applied to real-world applications and/or human concerns and/or various use cases — tends to segment or break an analogue area into two parts.

1 — it tends to break something down into smaller and smaller pieces. Almost kind of following the whole notion of digitization. But the digitization also is twinned with another development, which is a more and more concrete structure or framework or schema for organizing all of the automated bits.

With increasing specification or increasing specificity and increasing levels of itemization, you have increasing sophisticated facets that link to the overall metadata and schema and the whole framework for how to mix-and-match or

remix and match the various pieces into useful, fungible, saleable pieces of content. Does that make sense?

SM: Absolutely, Michael. As you said — a lot of it can only be automated. You really can't attempt most of these manually. There's a huge amount of content. Legacy. Long tail.

What I'm seeing is that people are increasingly looking at models and value of content as to what the production cost is, and hence, access.

Let me give you an example of a newspaper company in the financial business. The company has a lot of financial and market data. They can surely monetize and convert this into trends for the financial industry or the consumer to hedge for a natural calamity somewhere in this world. But that is such a hard thing to do, from bringing all that information together to classifying it and making it more meaningful and so on and so forth. I think people are taking small steps. There is some planning happening in that area. But I've not seen many people investing a whole lot of energy there. They're really in an experimental state, right now, as far as I see it.

SB: Michael, if I may add one point, here. This is Subhankar. The packaging of content that's been produced is always a matter of convenience. As an individual, every human being probably wants something different, something unique.

Obviously with the digital era, now there is the potential to break down the content to whatever people want. For example you can sell one complete book or simply a chapter in the book. This was not possible before the digital era. However, it is quite difficult to really figure out how much each IP (a full book vs a chapter) is going to cost a person.

Administering that IP itself is going to be a challenging exercise. I think that's why we're seeing the emergence of complex rights and product fabrication applications.

MM: That's very insightful. Thanks.

This gets to another question that was prompted a while ago. But I want to bring it forward now, in terms of the supply chain. Specifically in publishing.

An interesting development we've seen in the professional publishing and journals, and the business or non-fiction area — as opposed to the entertainment or romance novels and science

fiction and stuff. That is the emergence of what's now being called the "Networked publication," or the "Open publication." Where the author basically creates a wiki or a hybrid kind of structured wiki, where he or she controls the structure. Then posts small chunks of his or her work in some sort of logical schema. Then, opens it up for an *ad hoc* review of peers.

It's not really a peer review in the formal sense of academic research or academic scholarship. But fundamentally, the author engages in this collaborative interactive development of his or her work — harnessing not only the dynamics of social media, but — to your point, Sandeep — that long tail. Where you've got bloggers that now will comment on or expand on or somehow reference back to core knowledge and core material.

In the course of this, three things happen that are pretty exciting and potentially disruptive. First, and perhaps most importantly, the author's building a market around a new published work. And the market are the people who have contributed to the conversation — either as an editor or an appender or poster or blogger.

The second thing that happens is that as a function of the communication and interaction, which is how adults learn — as a function of this rapid cycle of communication and interaction with multiple stakeholders — ie representatives of buyers in the market — the author ends up being forced to refine, to extend and really to vet and optimize his or her authored work, so as to really kind of optimize it for broader consumption and market appeal. If, in fact, that's his or her intent. Or optimize it for more precise scholarship and/or linguistic elegance.

Then the third thing that happens out of all of this is that it ends up creating a whole bunch of ancillary content — be they a members-only area to a forum, a blog or a wiki, et cetera — that becomes a source of incremental revenue. Not just for the publisher, but perhaps even for the author.

To that end, Sandeep or Subhankar, have you seen this kind of notion of an open publication or a network publication emerge in any of your engagements? If so, what insights could you add or share about that?

SM: Michael, if I could take that question, part of it, at least — what was the challenge that

publishers or that an author was facing all the time? The author had no direct connection with the consumer. The publisher was there. The brand was important. Print was of immense value.

There was the whole customer-relationship-management not reaching the right stakeholders. The publisher had not invested in that area. The publisher has done very little on the customer service side. And of course, they have not done anything to the author, because the author has taken one advance and then he's managing the customer model.

MM: Also, Sandeep — that also reflects the publisher's business model and what are traditionally very thin profit margins. That would not necessarily allow the publisher to find an extended operation beyond just getting the book out there and marketing. Is that correct?

SM: Yes. That's absolutely correct. At the same time, I want to say that it's just kind of a vicious cycle. Today it's all about service. If you're not able to provide that customer quality service, obviously you can't get a premium. So I'm emphasizing the whole concept that if you can provide customer service, you can get a lot of premium.

Having said that, what you really talked about is the phenomena of self-publishing and models the likes of Lulu.com — where you can go ahead and create yourself a publishing community and moderate that. We've seen that phenomenon growing. We've seen that phenomenon getting a lot of value.

Our publishers are sort of caught by surprise. They have not been on that bandwagon of seeing that kind of disruption happening in their revenue model or their business model. What publishers are now trying to do is to have a forum available. Let's talk about newspapers — news companies are promoting social networking and user interactivity on tiered websites; user-generated content has become very popular.

If you talk about publishers, publishers themselves have started sponsoring so many blogs for authors and for readers directly. From less known authors to well-known authors, the phenomenon is catching up. But largely, publishers are still taking a lead on this side. They're seeing it as disruption, and they're trying to invest in and jump on this bandwagon.

I think publishers today have huge under-leveraged and un-optimized value chains that they need to invest in to be more agile and to take publication faster to the market. Hence, they need to monetize that content.

All content has longevity and a time dimension to it.

MM: Sandeep, wouldn't you expect companies like an Ingram or an Amazon to basically say, "Well, look — we're getting our technical house in order." Or, "We've got a really state of the art technical platform." Why don't we move upstream into the creator community and enable first of all a highly automated online digital workflow creation process? And, oh by the way, the publishing's already built in. So, self-publish — it's Amazon. A need self-published directly into our e-book or our kindle kind of digital display.

SM: Michael, that's happening. If I can extend that example to the aggregators, now. Aggregators such as Google and Yahoo, etc — what are they riding on? They have great customer access available. They're going back to newspaper companies and are trying to bring their catalogue online.

If we deeply analyze that revenue model, you'll see that 70 per cent of that revenue goes to the aggregator and that 30 per cent goes to the creator.

If you have a customer community and if you have the right customer experience available and if you can leverage that well, essentially, you can make a lot of money out of it.

You're absolutely right. That description has definitely taken us by surprise. There are growing aspirations among the likes of Google within news and book publishing platforms to cannibalize the whole print business altogether and even online business to a great extent.

However, I still feel that the value of publishers is that they have a huge repository of very meaningful content and editorial process. If they manage their content well, they could change their scenario altogether.

MM: Excellent.

I think it's probably at this point, we'll begin to summarize on the publishing supply chain.

So, Sandeep, in the presentation that you gave me called, "Content 2.0," I'm looking at a graphic on Page 7 called, "The changing role of the publisher." I'm wondering if you can just

Figure 1: Content 2.0: Network publishing for new age publishers. A Network Publishing Platform enables content first authoring, collaboration, composition automation, multi-channel publishing and delivery

take us through that. Again, it's going to summarize a lot of the things that we've been talking about, but it's also going to take it to another level of granularity.

SM: Sure. I can do that. If you look at it in this light, it essentially talks about that in the past, you were looking at a single source of data. Now you have several types of data and several sources of data available. And we get it and create value out of it.

One of the growing trends in the publishing community is multi-source ingestion. Most of the futuristic publishers are looking at multi-source ingestion, which essentially means that they're trying to ingest data as it comes from any medium: official data, user data or even existing data for that matter.

Trying to aggregate and annotate the whole lifecycle that we talk about — aggregation, annotation, filtering mapping, ranking and indexing — essentially means having a common view of this disjointed data. Creating a relationship between this data, and making sure that the relationships are well established, and well structured and so on and so forth is the key.

Once that is there, you can actually play with that either in terms of creating custom books or

creating e-books with multimedia. Or you can have a stream of revenue created by just providing certain professional information on multiple devices and delivering it in different ways, whether it's a very interactive user interface with Flash or Flex technologies, contextual advertising, or ad-supported content. Having it on any device, anywhere (Figure 1).

So this slide really exemplifies how today publishers and aggregators are trying to undertake these initiatives on a multi-source foundation. By offering value out of so-called technology-centric peer-review processes within their organization, they're addressing a large, untapped market.

MM: Excellent.

With respect to the particulars of the graphic below — to summarize, you said, "Okay. Publishers are figuring ways of multi-sourcing data. That would more or less correspond to your [GET]. Official data, user data and so on — aggregated — and metadata" (Figure 2).

SM: Now we're looking at not just publishing, but you've called out this notion of remix. That is mixing and remixing this data into forms that fit a particular market at a price that people are willing to pay.

Figure 2: The changing role of the publisher. Multi-source ingestion: content acquisition and transformation, aggregation, annotation, filtering mapping, ranking and indexing essentially mean having a common view of this disjointed data

MM: You were talking about interface, format and address. Can you just speak to each of those, quickly, and specifically? What do you mean by RES, RPC and SOAP and so on and so on?

SM: Sure. These are largely particular formats to actual content, like an address format that's really meant for one write, several reads of content and framework around that.

RPC is a remote procedural call. So how do you enable several systems to syndicate content from one system?

SOAP is another type of remote in call which allows you to get content through a unified interface, without worrying about what is the logic written behind it to retrieve and locate that particular content.

So these interfaces actually allow you to get content syndicated right from the source in different formats.

MM: Sure.

The other chart that I'd like you to speak to — I believe — is the one that says, "Book publishing industry solution map" (Figure 3).

SM: Okay.

I think we covered this solution map. We did talk about the several functions of a traditional book publisher supply chain or value map — or the solution map, as you call it.

I think you see some new flavors coming in. If you look at content acquisition, it's still called common connect position, but a lot of its content is odd things. A lot of it is self-publishing, as you talked about. A lot of it is about collaborative authoring among communities.

A lot of it is web harvesting. A lot of it is multi-source ingesting. Do the blogs remain as content acquisition? If you try to look at it from a digital standpoint, it is far more vibrant. That's one piece that is changing rapidly.

What is also changing very rapidly is on the sales and distribution side, especially the distribution part. The whole delivery to the web and digital delivery is very simplified as one block here. But digital distribution could actually mean delivery to several mediums, or delivery to different types of devices.

Also, there's a bit of complexity between several types of business models. We have subscription-led models, pay as you go models, etc. How do you protect those models? What about digital rights on devices? If I download an image or if I downloaded an e-book, how do I prevent it to be used only by an authorized access?

As I talked to you in the past, publishers were very averse to this whole phenomenon of

Figure 3: Essential structural shift. Advantages of networked publishing include efficient content creation, repurposing and multi-channel delivery strategies

customer-relationship management. Of late, publishers are investing a lot of money in marketing departments and are also looking at customer service and relationship management.

The relationship management — as you rightly said — can be a great source of feedback coming from the market. And with that feedback, it can lead to the product innovation and better development processes.

This whole supply chain is facing a tremendous threat. One has to really invest and create several optimizations on the supply chain. Otherwise we will see that the whole industry will get flattened by a lot of disruptive transformations, as I talked about.

The likes of several aggregators such as Google will cannibalize the whole book publishing and time-constraint publishing business. If you don't do things right — including the entire network publishing phenomenon, you create content independent of the device on which you undertake it.

Once you've created it in such a fashion, it'll be very easy to repurpose the content, make it localized to a particular geography and adapt it to markets accordingly.

A Philip Kotler book in India will carry case studies of local companies as compared to — let's say, AT&T or Cingular. So those are the things that I wanted to summarize on this slide.

MM: There were a couple of questions, Sandeep, in the lower part of the slide. Terms that we may need to simply quickly define.

At the infrastructure management level, what do you mean by RIM?

SM: RIM stands for Remote Infrastructure Management and it's becoming quite popular. It means essentially you are a publisher and you have multiple systems and platforms. One way you have people managing them is at your/their data centers. There are companies in countries like India, like HCL Technologies, that can actually remotely manage the data center in such a model, whether it's an end-user infrastructure or a digital infrastructure.

MM: So that remote infrastructure management might even include being able to route a printing job from one printer to another — or from one prepress operation to another?

SM: Certainly. That would fall into the purview of business process management and workflow.

In that review, you can define growth of users and business processes that need to be excluded beyond the enterprise into ecosystems and with vendor partners.

MM: That would be the next row down — right? BPO and KPO?

SM: That's right. BPO is Business Process Outsourcing. This is within two different areas in the publishing industry. One area is that there's a lot of work which is called to publishing houses that's being done outside today. The entire print composition piece that we talked about is one example. Whether you're talking about the creative brief given by a customer, creating the ad, illustrating it and animating it, or having it available composed in a print or online — that's one piece of the work.

The second area is imagining and digitalization. Format conversions from one format to another format, conversion from a print-out type to online XML, creating e-books out of your print books, or converting Flash books or Flash paper and content out of your print content — that's the kind of work that's happening on the imaging and digitalization side.

What is also happening outside is a lot of work. Let's say you are a legal information service provider. You have several thousand documents nested in your repository. But that needs to be abstracted and then a session can be on several levels and so on and so forth. Somebody wants to write a synopsis. Somebody wants to give SME tuned to that synopsis. So the whole markup indexing and classification is being outsourced and classified as Knowledge Process Outsourcing.

These are the services that have been very common beyond pre-press printing kinds of offerings.

MM: And the term, "KPO," is what? Knowledge process outsourcing?

SM: Knowledge process outsourcing. You've got it. Yes.

MM: Okay. Cool. So in the remaining five minutes or so, are there any particular elements of forward-looking — whether it's the next slide or whatever — that you'd like to touch upon here?

SM: I'll take this. Content 2.0 — A publishing platform for New Age Publishers. An integrated publishing platform which can really help you to streamline and optimize the digital supply chain and also supports the print supply. That's the good news. It allows you to create content, collaborate and ingest it all from multiple sources. At the same time, you can manage the content in several distributed repositories, reuse content and perform different types of search on that content. So you can look at it in the right kind of font.

MM: What do you mean by "FRM" service layer?

SM: FRM is Federated Repository Management Services layer. That essentially means you can have your digital assets repositories interfaced with content management repositories and file system databases. All these repositories have content, but how does that content go together from storage to process? That is an FRM layer in a nutshell.

MM: Yes.

SM: Then you have to make it available through several channels of delivery, and manage it well in terms of rights authentication, encryption and subscription management. It's also important that it all ties into the business processes and systems that you have in place. If you have a production planning system and that creates a production plan, is that production plan delivered on the current create-manage-deliverable workflow? Yes.

This is a very futuristic investment that we're undertaking, and that can really transform the whole publishing business, optimize content syndicated workflow, and enforce a lot of accountability. A lot of it is about dashboards for actions reporting process, correcting it and using all that data to best price from your composers. You can also improve predictability into schedule and reduce time-to-market allowing you to get books faster into the market.

That's really something that we are very well investing in. And we're seeing good results coming out.

MM: Thanks to both of you.