Chapter 2

THE NEED FOR A NEW MINDSET

BOOKS AND TEXT AS PART OF A PRODUCT-SERVICE SYSTEM

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> This would represent a move from paying for a product to paying for the service supplied by the product, which might be a welcome trend. After all, consumers buy refrigerators because they want food to be kept fresh, not because they like rectangular white containers (van Hinte 1997).

INTRODUCTION

This chapter analyses the shift in mindset necessary to accommodate emergent forms of digital text – a shift necessary to ensure publishers to continue to be integral to the publishing, distribution and sale of text. The traditional product-driven approach to book publishing will lose its dominance as digital forms of text become part of the service economy. We are likely to see the emergence of transactional models where the consumer pays to use, rather than own, a product. In some cases, the consumer's perception of the book as 'product' will shift to the digital text as service, and the combination of digital text and an etext Reader as a Product Service System (PSS). Publishers will need to accommodate a variety of product service approaches, including hybrid mixes that bring digital text to the reader in ways that may or may not depend on a physical product. This will require closer collaborative relationships with Information Technology specialists as publishers make the transition to new ways of operating.

The re-conceptualisation of digital text, combined with an etext Reader as a PSS, opens up possibilities for redefinition of reader expectations and consequently prompts change in how the publisher operates. The kinds of changes necessary to make this shift from product to product-service thinking will be examined in this chapter. This includes a number of case studies identifying

industries that have made, or are in the process of making, the gradual shift from an exclusively product-driven approach, to a Product Service System. A review of Napster's impact on the music publishing industry is part of our research. People's sense of music ownership and method of acquiring music has changed. The combination of peer-to-peer exchange of music files and cheap CD burners has created the conditions for a PSS. In this case, the end user now makes the product. From the perspective of a publisher, the re-conceptualisation of the publishing process as a PSS lends itself to a transactional model, where knowledge and information can be exchanged for payment or goodwill.

The second part of this chapter discusses the potential for new scenarios to emerge from current trends. In particular, a possible scenario applied to the printing and publishing industry is outlined and the modes of navigating through such a landscape are identified using fictional users and hypothetical case studies. Later in the chapter, we examine the conditions necessary to allow new markets to emerge, including the creation of a network on a macro-scale, which links various players.

PREFACE TO THE CHAPTER: SOME DEFINITIONS

Product, or *physical product*, means an artefact that can be touched, stored, and owned by an individual or group (Roy 2000).

A *service* is 'any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not be tied to a physical product' (Kotler 1988 in [Roy 2000]). According to Barras (1986 in [Roy 2000]) 'these services depend to a greater or lesser extent on physical products, but most services have become, or are becoming, increasing dependent on information and communications technology'.

However, it is necessary to specify the possible extensions of such terms. Oksana Mont (Mont 2000) has defined such terms as follows:

- A *product* is a tangible object produced to fulfil customer needs.
- A *service* is heterogeneous, mainly an immaterial activity or work performed for customers by a company or institution, usually on a commercial basis and consumed at the same time as it is produced.

- A *system* is any assemblage of things and elements (material or immaterial) forming a regular and connected whole.
- A *product system* is a system of products and services fulfilling one function – satisfying consumer needs. Product system development includes product design and design of a service system that minimises the product's environmental impact, as well as analysis of existing infrastructure and social arrangements that help to ensure a more environmentally benign performance of the product throughout its life cycle.
- A *product-service mix* is the extension of the service component around the product for business activities that are traditionally product-oriented; and the introduction of a new service component marketed as a product for business activities that are usually service-oriented. A product-service combination has the same meaning as a product-service mix.
- A *product-substituting service* enables fulfilment in such a way that it brings a significant decrease in the materials, or products, required for the fulfilment of customers needs. For example, a telephone company may substitute an answering machine with an answering service.

AN EMERGING TREND

Over the last few decades, some industries have concentrated on new strategies that shift their focus toward the provision of services, or a mix of products and services (Product-Service Systems or PSS).

Oksana Mont (Mont 2000) proposes a definition of a Product Service System (PSS) as:

- A pre-designed system of products, services, supporting infrastructure, and necessary networks that fulfil consumer needs.
- A *dematerialised* solution to consumer needs and preferences. 'Dematerialization' is a term used referring to a need 'for a radical decrease in the material intensity of industrialised economies' (Heiskanen, E. 2000).
- A new interpretation of the product value chain and way of delivering utility to consumers that has less environmental impact than separate products and services fulfilling the same function outside the system
- A self-learning system with the goal of continuous improvement.

- A PSS orientation allows the replacement of traditional concepts of product utilisation that are 'physically tangible' with the idea of fulfilling consumer need through the provision of dematerialised[1] system solutions.

There are various approaches and trends in the development of Product Service Systems. The first of these relates to the opportunity of selling the *use* of a product instead of the product itself. A second trend is focused on a shift towards a *leasing society*. A third approach considers the substitution of goods by means of a s*ervice machine*. Another way of approaching the development of a PSS involves the definition of a *repair society* instead of a *throw away society*. Finally, it is also possible to work on a shift of the consumers' *attitude* from product sales to *service orientation*.

A key feature of Product Service Systems is that 'they are designed and marketed to provide customers with a particular result or function – clean clothes, mobility, warmth, etc. – without the customer necessarily having to own or buy physical products, such as a washing machine, a car or fuel, in order to get that result' (Roy 2000).

Industries shifting towards Product Service Systems deal generally with an approach that can be either *result* or *utility* oriented.

In the first case, (some examples are provided below) the objective of a business becomes the supply of 'results' rather than physical products (Manzini 1997).

SOME RESULTS-ORIENTED CORPORATIONS[2]

Bibo Company, Italy

In 1993, the Bibo Company shifted from its initial business of mono-use plastic dish production to the provision of a service for collective and public restoration services. It involves reclaiming and recycling plastic dishes. The company retains the ownership of the products throughout the whole cycle. The adoption of a new business idea has produced a more eco-efficient system and a new set of products. To improve the profitability of the service, Bibo has completely re-designed its products.

[1] According to Colombo, U. (2000). *La tecnica potrà assicurarci uno sviluppo senza saccheggio.* Telèma 20, it is possible to argue that 'now in industrialized countries the homo faber era – focused on a quantitative production facet - is terminated and a new one has started: a qualitative and dematerialised facet that implies a shift towards the provision of services, software and products with an increasingly minor material quantity and that require less energy and resources.

[2] Centre for Sustainable Design, 2001; Rocchi, 1997

RMM Energy GmbH, Germany

RMM offers a services package to its customers consisting of analysis of energy consumption and conservation potential; recommendations for conservation investments and energy management; guidance on project tender, execution and completion; assistance with grant applications and reviewing of delivery contracts.

Zeneca Group PLC, The Netherlands

Zeneca has developed an integrated pest management approach that can be tailored to the local situation. In the Netherlands, in particular, the results of Integrated Farming System experiments have indicated that in sustainable farming techniques, pesticides use can be reduced by 58-65%.

Gispen, The Netherlands

Gispen is a designer and producer of Office furnishings that provides a leasing package to customers. It also provides a consultancy service for product specification. Once the furniture is installed, Gispen also assist the customer in moving, updating and reconfiguring the office furniture for new office plans. They become a partner and facility manager for the customer.

Oce, The Netherlands

Oce produces photocopiers and printers and is committed to the environment as well as eco-design and has been involved with various projects in the Netherlands. Oce design products for a long lifetime and since 1990 they have reused their products and components re-placing them into the market or recycling into raw materials.

Odin Organic Vegetables, Netherlands

Odin supplies organically grown fruit and vegetables direct to consumers from Farmers. The consumer receives the produce by paying a fixed subscription fee. Growers on a fixed price contract supply all produce to Odin, without using third parties such as wholesalers or auctions. Odin also offers its growers expert advice on agricultural and horticultural matters as part of the supply relationship.

Further examples in this category are: Xerox, SafeChem, Renew Inc, Wilkhahn and Alpha-Fry Group.

Within such a framework, a corporation has an economic interest in increasing the eco-efficiency of the system 'through an optimisation of the use of materials, components and products and/or and extension of their "life". The aspect of discontinuity of these initiatives can be mainly recognised on the producer side since the shift from provision of products and services to supplying a new product-service mix requires a deep change in the mission and often in the structure of corporation' (Rocchi 1997).

In the second case, the objective of a business becomes to promote the rental, leasing, and common use of goods (Manzini 1997). In this situation, a corporation has an economic interest in

increasing the eco-efficiency through 'an intensification of the use of products and the reduction of their consumption. The aspect of discontinuity of these initiatives can be mainly recognised on the user side since they require a change in the behaviour and consumption patterns, such as the shift from individual use and ownership of products to the renting, leasing, pooling and sharing services' (Rocchi 1997).

Cookson Group PLC, England

Cookson supplies engineered materials – rent refractory furnace liners – to steel companies, eliminating refractory disposal and stocking problems. This means an intensification of the use of refractory furnace liners on one side, and an improvement in recovery and reuse practices on the other.

Electrolux Euroclean AB

Electrolux is promoting a new rental service for some of its professional cleaning equipment. The service includes extensive case-by-case consultation and suggestions on the choice of appropriate machines and cleaning methods. Training programs on the optimal use of machines, maintenance and repair service are also offered. Benefits include: environmental advantages related to the life-extension of the product, product use optimisation, recovery and refurbishing of components, and lowered total cost of use.

Kinko's chain, USA

Kinko's offer one of the most interesting leasing services within the electronic sector in the USA, whereby consumers can rent a computer for a short time, even as little as 15 minutes.

Black & Decker, GmbH, wash centres, and car-sharing organizations represent other examples within this category.

Some utility-oriented corporations (Rocchi, 1997)

According to Oksana Mont (Mont 2000), in such a scenario, the traditional physical product becomes 'the material component of a new, more comprehensive product-service and the consumer becomes a co-producer of the desired result'.

Consequently, a product can manifest itself in a number of different ways. Ezio Manzini (Manzini 1995) classified products into three main categories: result, community and duration.

A *result product* is the 'most innovative (and most complex) way of facing the theme of dematerialisation' (Manzini 1995). Results and possible ways of achieving them is the proposed method that allows a reduction in the need for material products. A result product, the efficiency of which can be measured in terms of the 'absence' of other (material) products, is what is offered. Since the

profits of a company depend precisely on its ability to reduce the quantity of fuel or electricity required, it could be said that innovative ability and business acumen is centred on the development of a 'negaproduct'.[3] Some examples, traditional or innovative, could be:

- prevention rather than medicine;
- pedestrian access rather than a need for cars;
- urban recreation facilities rather than forced tourism.

Community products represent one way of achieving the reduction of the material intensity per unit of service rendered. The method consists of intensifying a product's use to create the conditions necessary for its maximum exploitation. This represents a proposal of community products[4]. This category includes all the traditional public services[5]. Individual and public products can be viewed with a different mindset, creating intermediate zones between them. Some interesting cases of new collective uses emerge in ways such as car-pooling or sharing, the proposal of washing centres or collective kitchens organised in the form of clubs.

Prolonging the life of products and extending their use can achieve a reduction of the material intensity of the product conceived for individual consumption. Products in this case become *duration products* and represent a way 'to increase the useful life and correct disposal of a product, thus reducing the material intensity per unit of service rendered' (Manzini 1995). Such a method entails:

- A modification of the product's physical character in order to render it more durable and easier to maintain and recycle.
- An extension of the role of the manufacturer, amplifying the manufacturers responsibilities to encompass the entire life of the product.

In short, this means creating a form of partnership between the manufacturer and the end user to guarantee the function of the product (a relationship to which the manufacturer contributes his skill and the user his participation).

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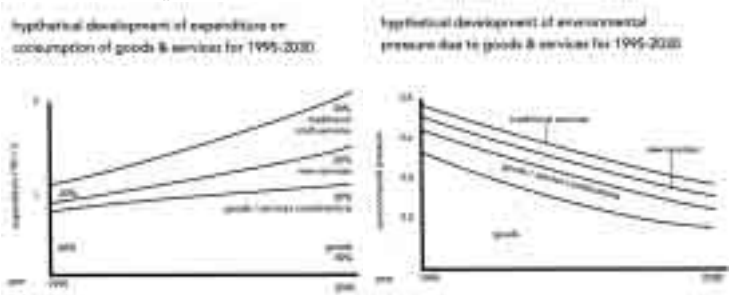
[3] In other words, it is measured by the tons of petrol and kilowatts of electricity that have *not* been used (negatons and negawatt).
[4] i.e. products conceived for collective use.
[5] While the fact that they are traditional as concepts does not imply that the public services cannot be re-conceived and proposed in innovative forms Manzini, E. (1995). Products, Services and relations for Sustainable Society, Doors of Perception. 2000.

As a consequence of the extension of companies' responsibility to the entire life of the objects, focus has shifted to an integrated whole of products and services, rather than on the product alone. The product service system embraces the entire life of the material product in question, with the objective of extending and turning it into a duration product.

Within this trend, technology allows faster, easier and cheaper ways of addressing specific customer's needs.

> Tools such as microeletronic, informatics, telematics, biotechnologies, and new materials have modified today's economic-productive system. This has entailed a situation where it is possible to have a different and more responsible 'relationship' with the environment and a more economical use of material and energetic resources (Colombo 2000).

The following figure represents on one side a hypothetical (for 1995–2030) development of expenditure on consumption of goods and service, and on the other, a hypothetical development of environmental pressure due to goods and service.



Hypothetical development of expenditure on consumption of goods and service and of environmental pressure 1995-2030 (van Hinte 1997)

This figure stresses an increase in service market potential, its benefits from an environmental perspective, and the flexibility of the market to accommodate a variety of solutions.

Rather than disappearing, certain sectors will need to develop specific strategies to allow flexibility to navigate in multiple ways within the market. The consequences of adopting such strategies would be decreased environmental pressure and a stronger and broader impact on the market.

THE REASONS BEHIND SUCH A SHIFT

Sustainability is the key motivator of the above-mentioned trend. An increasing awareness of environmental issues and the consequent strategies to properly address such issues is a primary motivator. Governments, business, research and the wider population have an increased awareness of environmental concerns such as global climate change and local waste disposal. This has resulted in 'pressure to reduce the environmental impacts involved in the production and consumption of goods and services' (Roy 2000). Such pressures have generated debate around how the planet should cope and deal with such issues, increasing a perceived need for a sustainable society.

A good example of how companies react to governmental strategies and regulations with a Product Service System can be located in the automotive industry, which has shifted its priorities as a consequence of the *Zero Emission Vehicles*[6] (ZEV) requirements in California[7]. Saturn, a division of General Motors, bowing to pressure from the *ZEV* requirements, and attempting to overcome customers' disinterest in electric vehicles, is promoting a leasing service for its electric car, the EV1.

The Honda Company has adopted a similar strategy for the Californian market, planning to lease 300 electric vehicles to fleets and customers. Toyota, Ford, Daimler Chrysler, and Nissan have followed with similar strategies.

A sustainable society implies the need for deep cultural, social and behavioural changes, while providing 'the (illusory) hope of improving systems of production and forms of consumption conceived in the past and rendering them compatible with the environment' (Manzini 1995).

In a mature industrial society, any transition towards sustainability generates the need for a production and consumption system capable of meeting social demands, but using 10% of the natural resources used at present (Manzini 1995). In many cases, sustainability issues have been addressed as a consequence of

[6] In 1990 the California Air Resources Board adopted the Zero-Emission Vehicle (ZEV) program. The ZEV program is an integral part of California's Low Emission Vehicle program and is intended to secure increasing air quality benefits for California over the long term.

[7] Zero emission vehicles (ZEVs) and near-zero emission vehicles are a key element of California's plan for attaining health based air quality standards.

governmental policies and regulations. Governments have driven Product Service System strategies, leading countries towards new ways of operating within the market.

Cees van Halen, Harry te Riele, and Mark Goedkoop (Mark J. Goedkoop, 1999) remark that knowledge of Product Service System enables:

- *Governments* to formulate a next step in policy concerning sustainable production and consumption patterns, and;
- *Companies* to find strategic options for business growth, renewal, innovation and diversification.[8]

In addition, the design of Product Service Systems may involve the development or use of 'eco-efficient' products that use less energy and materials and generate less pollution and waste (Roy 2000). Like other industries, publishing and printing cannot underestimate the importance of these issues. From a perspective of sustainability, the impact of these industries is substantial. Various printing techniques have an inherent environmental impact that needs to be highlighted.

> Lithographic printing is used to produce half of the material printed in America each year. There are two types of lithographic printing: sheet-fed and web.
>
> Sheet-fed presses run individual sheets of paper through the press, while web presses feed paper continuously from a large roll and can use either heat-set or non-heat-set inks. Once the image is printed onto the substrate, the paper is fed back onto a roll or is cut and/or trimmed into specific shapes and sizes. Web lithography is designed to print large jobs and is used for newspapers, books, catalogues, periodicals, advertising and business forms. Sheet-fed lithography is used mostly for short runs of books, periodicals, posters, advertising flyers, brochures, greeting cards, packaging and fine art reproduction.
>
> Preventing pollution at the source may be achievable at each production step used in lithographic printing. To begin evaluating and implementing pollution prevention opportunities within the printing process, principal input materials and processes need to be outlined. The principal materials used in lithographic printing are inks and paper substrates. Additional input materials are photographic films, photo processing chemicals (developers, fixers, wash baths, reducers and intensifiers), printing plates, plate processing chemicals, fountain solutions, cleaning solvents, correction fluids, rags and water.

Lithography's impact (Illinos Waste Management and Research Centre)

Flexographic printing has considerable impact on the environment due to its use of rubber and photopolymer plates,

[8] It is especially inspiring for those companies who regard sustainability as a co-pilot for management strategies.

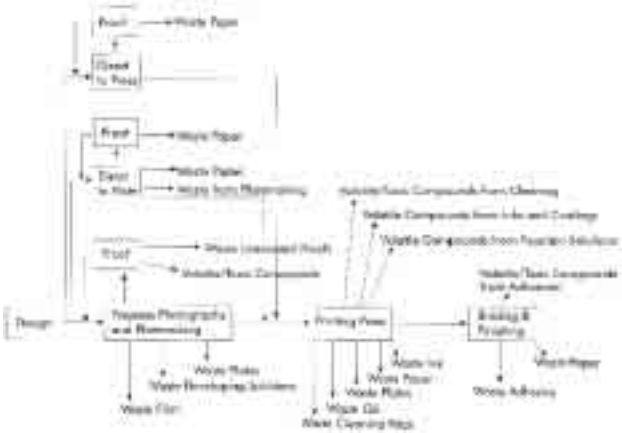
solvent-based inks, and hydrocarbon solvents, as well as a broad range of substrates. Printers select and mix chemicals for a variety of prepress and pressroom applications. Darkroom chemistry, plate making, inks and solvents all use chemicals to achieve the ultimate goal of transferring a quality image to a substrate (Shapiro, 1993a).

The traditional flexographic operation has many large, open containers for inks and solvents, which are used in the printing process. These evaporate rapidly into the plant and are emitted through the exhaust stacks. Process waters are discharged from darkrooms, cleaning tanks and cooling systems. Water-based inks may result in cleanup wastes going to sewers or septic tanks. Adhesives used in conversion may also find their way into the water discharges. These wastes may still be considered hazardous in some states, depending upon their composition. The state regulatory agency will be able to provide guidance on this issue. The manufacture of engravings for rubber plates and photopolymer plate processing introduce sources of air, water and hazardous wastes.

> Producers of all goods, along with consumers and governments, share the responsibility of minimizing the environmental impact of the production, use and disposal of goods. In the publishing industry, wherever feasible, magazine publishers will reduce their consumption of materials and energy, promote the re-use of magazines and take steps to further improve the recyclability of magazines (Canadian Magazine Publishers Association).

Moreover, the Canadian Magazine Publishers Association also stresses how:

> …the realistic goal for magazines is to minimize waste, and the first step in this process is to determine the amount of waste produced at all stages of magazine production. In the same way that subscribers are consumers of magazines, so are magazines consumers of raw materials and, like all consumers, magazines have a responsibility to make informed choices regarding the purchase of materials and services. Again, these choices will necessarily balance environmental concerns with the economic realities and readership demands of each publication. There is no single industry-wide right choice. Rather, each magazine will be faced with fashioning its own ideal response (Canadian Magazine Publishers Association).



Typical Lithographic Printing Process and Principal Releases to the Environment (Anderson C.L. and L.N. Epstein, 1996)

In 1995, The Environmental Protection Agency (EPA) proposed a regulation to 'reduce emissions of air toxics from the printing and publishing industry. Air toxics are those pollutants known or suspected of causing cancer or other serious health effects.' (Environmental Protection Agency 1995).

This regulation covers two distinct segments of this industry:

> Publication rotogravure printers produce saleable paper products such as catalogues, magazines, newspaper inserts, and telephone directories. Package-product rotogravure and wide-web flexographic facilities print on paper, plastic film, metal foil, and vinyl for use in products such as flexible packaging, labels, gift-wrap, floor coverings, and decorative laminates. Air toxics are released from the ink systems used by these types of printers' (Environmental Protection Agency 1995).

The Environmental Management Manual[9] by the Printing Industries Association of Australia (PIAA) addresses the key environmental issues facing the Australian printing industry today. Designed as a tool for the printing industry, the Environmental Management Manual aims identify and manage environmental issues associated with printing operations.

[9] The manual has been prepared by Environmental Consultants, Dames & Moore on behalf of the Printing Industries Association of Australia.

According to the PIAA, the manual has been designed to raise awareness of key environmental issues within the printing industry. The association has preferred to focus on the 'internal management of operations that can have a negative impact on the environment' due to the continuous changes of environmental standards. The adoption of a program of continuous improvement in environmental performances is suggested so as to 'stay in touch with environmental legislation and to take advantage of the benefits of improved environmental performance' (Printing Industries Association of Australia 2001).

As the Australian Bureau of Statistics reports:

> Industry is the major consumer of energy in Australia. As a matter of fact, in 1997–98, 78% of total energy consumption in Australia was generated by three sectors: electricity generation, transport and manufacturing (Australian Bureau of Statistics 2001).

It is clear that the printing and publishing industries contribute significantly to this consumption.

	1990	**1998**	**Change**	**Percentage change**
Sector	Mt CO2 –e	Mt CO2 -e	Mt CO 2 -e	%
Energy	299.6	362.9	63.3	21.1
Industrial processes	12.0	9.8	–2.2	–18.4
Agriculture	90.6	92.2	1.6	1.8
Forestry & other	–27.2	–24.5	2.7	10.1
Waste	14.9	15.5	0.6	4.2
Net emissions	389.8	455.9	66.1	16.9

Greenhouse Gas Emissions, by Sector - 1990 and 1998 (Australian Bureau of Statistics, 2001)

The Australian printing and publishing industry also contributes to the strong impact of timber harvesting and a related concern for all Australian native forests.

> Other impacts of forestry can include damage to the soil structure, siltation of streams and rivers, loss of aesthetic value and introduction of weeds and feral animals. One major impact of timber extraction is on animals that live in tree hollows. Approximately 14.5% of Australia's vertebrate fauna depend on tree hollows. Hollows are also used by a large but unknown number of invertebrates (Australian Bureau of Statistics 2001).

As the forest industry in Australia is also expected to meet environmental standards for waste disposal and land degradation, the cost of production is increased by such factors.

By world standards, Australia's total emissions of carbon dioxide and other greenhouse gases are low, representing only about 1% of emissions worldwide. However, on a per capita basis, the emissions are very high.

Sulphur dioxide (SO2) is generally emitted by cars, during coal burning, oil combustion and industrial processes such as wood pulping, paper manufacture, metal refining and melting, particularly from ore containing sulfide.[10] SO2 causes irritation of eyes, nose and throat, choking and coughing. Exposure of the eyes to liquid sulphur dioxide can cause severe burns, resulting in the loss of vision. Other effects include headache, general discomfort and anxiety. Those with impaired heart or lung function and asthmatics are at increased risk.

At the same time, the trade deficit in wood products must be highlighted. It is generally caused by the structure of the industry and its productive capacity, especially in pulp and paper products (Australian Bureau of Statistics 2001). Pulp and paper products account for 70% of Australia's imports of forest products. Australia currently imports printing and writing papers, principally from Finland and Indonesia (Australian Bureau of Statistics 2001). According to Abare, since 1995–96 Australia has exported a 'greater volume of timber than it imports but in terms of dollar value, we still import more. Australia has a trade deficit of $1.9 billion in wood and wood products (ABARE 1999b). Also, Jaakko Poyry Consulting reports that pulp and paper account for 70% of this import bill' (Australian Bureau of Statistics 2001).

The printing and publishing industry needs to balance market requirements and industry needs while meeting sustainable standards.

SHIFTING THE MINDSET

What happens if we apply a shift towards sustainable strategies to the printing and publishing industries? Is it possible to balance environmental concerns and the need for action within this

[10] Small textile bleaching and food preserving facilities, wineries and fumigation activities can also emit sulphur dioxide. Hot springs, volcanoes and decaying vegetation are natural sources of sulphur dioxide.

industry? What happens if people in these industries shift their mindset to accommodate PSS oriented strategies?

Such questions highlight the need for new ways of thinking and innovative modes of operation in order to cope with both government demands and pressure for sustainable products-services. Moreover, information technologies are enabling new ways of dealing with written content that do not require a printed output.

The printing and publishing industries are now in a situation where they can either address issues of sustainability and optimise their use of new technologies, or fall behind community expectations and government will. Adopting a proactive approach will not only address issues of sustainability but may also rejuvenate the entire industry. This seems to be an imperative rather than a choice. Within such a scenario a shift toward Product Service Systems seems appropriate as it minimises environmental impacts of both production and consumption. Moreover, such an approach allows production to become a more flexible activity and to create and maintain a system of relationships between producer and consumer (Mont 2000). A PSS approach opens up a range of new roles and possible activities that create a value that should not be underestimated.

Some authors outline the implications of what they call a *servicizing principle* within the business world, 'focusing on the manufacturing sector and added value that servicizing can bring both for the economic well-being of the organisation concerned, as well as less environmental impact of consumption' (Centre for Sustainable Design 2001).

Van Halen, te Riele and Goedkoop (Goedkoop M. J. 1999) point out some key successes in using a PSS oriented approach:

- Creating value for clients, by adding quality and comfort;
- Customising offers or the delivery of the offer to clients;
- Creating new functions or making smart or unique combinations of functions;
- Decreasing the threshold of a large initial or total investment sum by sharing, leasing, and hiring;
- Decreasing environmental load. Often this will bring additional and perceived Eco-benefits;
- Increase the quality of the contacts with clients.

Consumers, producers and service providers are all engaged in some fundamental shifts (Mont 2000):

Consumers need to shift from purchasing product to purchasing services and system solutions that have potential to minimise the environmental impact of consumer needs and wants. Such choice requires a higher level of customer involvement and awareness.

Producer and **service providers** have a higher degree of responsibility for the product's full life cycle, the early involvement of consumers in the design of the PSS, and design of the service system for the product.

Both **consumers** and **producers** are involved in a change in property rights. In general, a PSS is likely to give more attention to the usage phase of the product's life cycle (consumer stage), than current product systems (even allowing for eco-labelling and other approaches to consumer awareness).

Stefania Rocchi (Rocchi 1997) highlights the basic common characteristics of a PSS. Such characteristics are based on some new business ideas that require a cultural and often an organisational change. At the same time they present some interesting environmental performances as a result of a leap away from the traditional way of thinking and doing business. These characteristics require some shifts of various points of view. These shifts, and a parallel for the Publishing and Printing Industries, are provided in the following paragraphs.

The first shift is from the supply of a product as a physical result of an industrial production process to a new product-service. Such Product Services act as integrated systems of product and service components, which are designed, produced and delivered within a different production paradigm.

An example of such a shift in the printing and publishing industries would be the shift from the concept of book as physical artefact to the idea of content delivery, including all the surrounding support services the industry could provide.

	From	**To**
Shift	Product as a physical result	Product-Service
Applied to P&P Industry	Book	Content provision

Shift 1.

A second shift is from the supply of a traditional service[11] to a new product-service mix designed, realised and marketed as a 'product'. This is the case for the selling of packages of services and activities rather than simple services (e.g. a package that includes an ebook Reader and ebook together with the potential to print-on-demand that ebook, plus access a web-based customer support service).

	From	**To**
Shift	Traditional concept of services	Innovative Product-Services marketed as 'products'
Applied to P&P Industry	Online book selling (e.g. Amazon)	Package including: ebook, print-on-demand facility, customer online service, community of readers club…

Shift 2.

The third shift is from a business-as-usual attitude to a business model able to accommodate the opportunities opened up by the challenge of sustainability. This includes:

- The capacity of an industry to re-create and re-invent itself in creative and opportunistic ways within the limitations and possibilities imposed by technology and market needs, and;
- An unpredictable set of new products, services, and roles that can be generated by entrepreneurial and innovative activities leading towards the creation of new mindsets.

	From	**To**
Shift	Business-as-usual attitude	Reinvention of new business model
Applied to P&P Industry	Follow the market, using what the market offers with traditional business models.	Lead the market via a redesign of roles and the proposition of new services, products and ways of operating.
Risk	Low	Higher
Benefits	Low; stable initially, but possible decrease of activity and leadership on markets over time	Higher; opportunity to open up new markets; chance to lead the market; new activities generated by entrepreneurial activities outside traditional boundaries.

[11] As the immaterial result of business activities traditionally operating in the field of services

Shift 3.

Shifting towards a PSS mindset means re-inventing the industry, taking into account new limitations, but also recognising new opportunities offered by changed circumstances. Within such a scenario, those in the industry must more than consider the relevance of IT related opportunities – they have to *exploit* them.

Such an attitude would allow the industry to create, recycle, and redesign the roles of the various stakeholders. The industry would be capable of renewing its activities and of providing new services capable of addressing new and emerging needs.

In a recent Investigative Documentary broadcast by Radio National, the increasing shift of information control to publishers has been highlighted. Regarding such an issue, Kenneth Frazier, Director of Libraries, University of Wisconsin, has pointed out that:

> It represents a new kind of control for commercial publishers. It is after all, now not just selling individual journals, but it's selling access to a corpus, to a database, and restricting the ways in which that database can be used in the future. Most of our small emerging incubator businesses and biotechnology and other technological fields, depend upon the university for information access. This means that if they're going to have access to the content from the big publishers, they're going to have to have a direct contractual relationship and pay by the byte (Correy 2001).

Shifting means opening up new opportunities, challenges, markets, activities, modes and roles. Among many opportunities, ebook-related scenarios should be considered a viable proposition for the publishing and printing industries. Such scenarios are appropriate for a PSS mindset.

The first shift concerns the provision of information and knowledge rather than books. In such a framework, the opportunity to read is provided, not the book itself. The focus is on providing access to information, more specifically on the different modes of provision. This choice can lead to an added value provided by a set of services (e.g. a community of readers is established around a text). Moreover, the shift towards services can lead to new products, implementation and different uses of existing ones, as well as the negotiation of new roles and sets of services. Indeed, the new context can create a situation where new competencies and sets of information are required.

A good example of such a tendency is the activity of the *Ohio Environmental Protection Agency* (Ohio Environmental Protection Agency 2001) that, reacting to regulations and concerns related to the environmental impact of the publishing and printing industry, has started a series of activities and set of services to be used as prevention resources (some of them are highlighted below).

Activity of the *Ohio Environmental Protection Agency* (Ohio Environmental Protection Agency, 2001)

Office of Pollution Prevention (OPP) provides technical assistance services including printing industry-specific pollution prevention information searches, non-regulatory one-on-one consultations, on-site facility technical assistance, and pollution prevention assessments.

Printers' National Environmental Assistance Centre (PNEAC) is a 'virtual' centre electronically linking trade associations, governmental and university service providers to efficiently provide the most current and complete compliance assistance and pollution prevention information to the printing industry.

Enviro$ense is a free environmental information system developed and maintained by U.S. EPA to provide public access to the latest technical and programmatic information on pollution prevention and environmental compliance.

Design for the Environment (DfE) is a cooperative U.S. EPA-industry project aimed at developing specific pollution prevention information for small and medium-sized printers. Each of the six different methods of printing in use today has different chemical and technological alternatives.

The Great Printers Project (GPP) is a joint initiative of the Environmental Defense Fund, the Printing Industries of America, and the Council of Great Lake Governors. The goals of GPP are to make pollution prevention the primary choice of the lithographic printing industry and to recast the approach to environmental policy by bringing together representatives from industry, government, labor, and environmental groups.

In a different way, the acquisition of 30% of mightyworld.com by Barnes & Noble is a further example of how certain shifts can lead to unexpected or new ways of looking at the market.

Scholastic Inc., a leading editor and distributor of children's books, has launched a new promotional campaign for *Renmants* (a new series of books by K.A. Applegate) using ebook technology in an alternative way – the first five episodes are available free of charge as ebooks in Microsoft Reader format. The launch precedes the official print-based launch. The five episodes will be accessible via a normal PC and readable on a Pocket PC. This initiative is connected with another, *Renmants ebook Sweepstakes*, that allows readers to win Pocket PCs.

This initiative seems to argue that, even if ebooks have not taken over the market as fast as expected, it is possible to reinvent such a market and find alternative solutions. In this case, an ebook is interpreted and used as a marketing tool.

An example of a paradigm-shaping company is *ebrary*, which has a collection of high-interest digitised books and other material available on its site for browsing and purchasing. 'Many others have the same, but ebrary breaks new ground, both in shopping for and purchasing its information'(O'Leary 2001). Ebrary founder Chris Warnock explains:

> We perceive a model in which the information can be freely accessible, and in which the publisher and author can still be compensated. It not only maintains the essential spirit of the Internet, but also provides additional revenue opportunities for publishers, libraries, and authors…We have the opportunity to do something that no one else has done before, to create something that will really make a difference. We're providing people with a way to access knowledge and then acquire what will enrich them. We're giving people a way to quickly find a specific needle in a very large haystack in a way that anyone can afford' (O'Leary 2001).

As O'Leary (O'Leary 2001) has pointed out:

> …ebooks are at the stage where numerous experiments are underway (only now we call them business models). There is a puzzling mix of technologies: readers, handheld, formats-and distribution models-subscriptions, paper-download, and print-on-demand. As in any technology shift, put your money on the companies that are creating the new paradigm instead of just tinkering with the old. These companies themselves may not make it – they are often bought out or fail because of bad business practices – but their innovations survive and shape the new market (O'Leary 2001).

If a shift towards a PSS framework is considered within the printing and publishing industries, it is necessary to define the various modes of content delivery. In order to recognise these modes, it is crucial to identify the different modes of reading. There must be focus on the reader and on how and why such readers interact with books.

Therefore a key question to address is: What does a reader want from a book?

TOWARD NEW WAYS OF LOOKING AT OUR READERS

Who is the reader? How does he/she interact with books? What are the gestures behind the act of reading?

The focus is on the users themselves and discovering what it is they want from books. The 'I want' or 'I need' metaphor seems the most adequate when identifying the best way in which modes relating to content and information are applied by various readers. The reader needs, desires, would like, thinks of and aspires to something. Such modes of interacting (with written content in our case) offer key insights into the ways in which the book–reader relationship can be interpreted.

For example, the user might say:

- I want to **own** that **book**;
- I **need** that information;
- I want to **own** that **information**;
- I want to **modify** that information;
- I want to **link** that piece of information to other information;
- I want to **share** information with […]

If we use a similar classification, it is clear that:

- The modes of delivery are the focus, rather the *tools* used to deliver;
- A flexible framework to accommodate such a variety of requirements becomes necessary;
- Various players need to shift their strategies and focus. The reader, not the book, is the focus.

The first point enforces the key role of a PSS framework within the printing and publishing industries. If a reader 'classification' is described with an 'I need' or 'I want' metaphor, the tools, which are generally used to deliver, dematerialise. The content itself becomes the principal focus. This highlights the industry importance of a shift towards the provision of content rather than physical artefacts. Content, in this case, could easily be configured as a system (of services, links and products) that is marketed and branded as a product.

Therefore a shift towards a PSS framework does not imply a reshaping of the industry in order to 'abolish' or 'deny' the importance of paper-based content. Rather, it means that physical products (in this case, paper-based content) could be reinterpreted, redesigned, and linked with other aspects of production. In such a

way, the physical artefact (the book) becomes one of the multiple components of a system that better addresses new market requirements.

The second point highlights the importance of constantly shifting market orientation to address needs that can change quite rapidly over time. The market is not only faster, but also more demanding in terms of variety.

Readers seem to require everything now. The only way to address properly such needs is to incorporate a flexible framework that includes a variety of features, such as:

- Opportunity to explore different ways of accessing information and content (the places where information is available)
- Opportunity to read in different ways (the tools to access information)
- Opportunity to read when it is required (the time and speed required by the reader)
- Opportunity to choose information and content (the 'things' to read)

There is not *one* reader and *one* mode of reading. This should be addressed in ways that accommodate readers' needs and also address industry requirements, capacities, and potentials.

The third point highlights the importance for industries to shift emphasis towards end users. Users shape, shift, and reject or accept the products and services offered by markets. This is recognised by all major industry sectors. Such a change in mindset opens up opportunities to effectively use and positively interpret users' needs. If industries listen to, and understand users' requirements, addressing those needs will not only benefit users but printers and publishers as well.

The printing and publishing industry is in a critical period in which it must redefine its focus and strategies to properly address readers' needs. The act of asking is not the only act required. Asking the right questions, being able to listen to the answers, and translating those answers into products and services, is necessary for survival. Also, users could themselves be involved in the design process of new strategies and systems.[12]

[12] Entire branches of design focus on concepts such as user-centreed design and participatory design, where the end user has a key role in shaping the final 'product'.

CREATING A FRAMEWORK

The various agents involved in the aforementioned framework need to be linked so that constant and rapid market movements can be addressed. But how can we link these agents?

The user '*wants information right now and in the format he/she needs it*' (a quote from the Brisbane ebook trial focus group, July 2001). There is not only one answer ('here's the book') to one question ('Can I have that book?') anymore, but a series of possible questions that can vary over time giving rise to a series of possible solutions that address diversity and variability. What then has to be considered as 'key design objects' are the links and interfaces between the various agents. To achieve this, all agents, their skills and requirements, what they can offer and what they could offer if a shift in mindset occurs, should be defined.

The entire sector has to be analysed in order to identify potential strengths and weaknesses. Each agent should actively participate in this analysis, as each agent's involvement is a necessary condition for a possible re-design of the industry. More importantly, the links among agents should be appropriately identified and restructured to address new user requirements.

Markets and users have changed, needs have changed, practices have changed and complexity has increased. Users' ways of interacting with content and artefact have changed. The traditional ways of approaching the needs of the market are unsuitable. Various industry sectors have already acknowledged such shifts and modifications and tried to address them in innovative ways. In the following section some examples are provided.

MOBILE SERVICE PROVIDERS – A PARALLEL WORLD

A good example of a market that has shifted its focus and offers interesting alternative modes of operating is the world of mobile phone service providers. In this case, the focus of the market has shifted from the handset to a bundled set of products and services – a PSS.

We do not buy a phone anymore, we buy the connection with others and the opportunity to speak and communicate. The mobile phone industry has understood such issues and has addressed them by providing the opportunity to connect with others via a contract

that includes a series of complementary services. The handset (often free of charge) is seen as secondary – a tool to use the service. It has been dematerialised, becoming simply the mediator between one person and another. The user pays for the opportunity to speak with others.

A similar example is the dematerialisation that has occurred in the music industry. Young listeners now speak about *gigabytes of music*. In this scenario, Napster's[13] impact on the music publishing industry has been substantial and it has changed people's sense of music ownership and their method of acquiring music. According to John Fanning, one of Napster's founders, 'Napster is a microcosm of what's happening on the Net' (Sullivan J. 1999). Napster seems to be much more about community. People like it because it 'combines existing elements of the online music experience into a single application that allows people to talk about what music they like and trade files [of music]' (Sullivan J. 1999). All a user has to do is type in the name of the song or artist and 'up will pop 2,745 Phish songs sorted by the host computer's type of modem connection and ping rate' (Greenfeld K.T. 2000).

A characteristic of the Internet, which allows people to 'swap and swipe' products, has been the perfect ground in which a service such as Napster could develop.

> By now, the long-running legal battle between the Record Industry Association of America (RIAA) – representing the traditional recording industry – and the millions of college kids downloading free jams over the Net has begun to resemble those chewing-gum commercials where fusty geezers shake their canes at crazy kids and their *flavor crystals*. The latest twist in this saga of college kids ignoring their elders, not to mention copyright law, is the emergence of file-sharing software that makes it easy to swap with fellow pirateers music stored on computer hard drives--generically known as MP3 files (Greenfeld K.T. 2000).

'You don't have to worry about buying CDs,' says college student Nilay Shah, 'you can just play them on demand' (Potter N. 2000).

The Napster phenomenon is a component of a much larger issue regarding the way people interpret and get music. 'No longer do you have to go to the store and plunk down money. To the big record

[13] Napster's software combines chat features with a music player, and lets users share MP3 libraries with one another.

companies, the concept might seem rather scary, but instead, they're busy beating Napster at its own game' (Potter N. 2000).

However, the role of companies such as Napster is more influential than it might seem. Strauss Zelnick, the president of BMG Entertainment stresses how 'even piracy, that's hands-down a copyright infringement, can in certain instances speed up the process of legitimate market development' (Potter N. 2000).

The Napster experience can look fatal to the industry's current business model.

> Free music has long been available to listeners: it's called radio, and a few people have made a few bucks from the medium. But the crucial difference comes down to a business-school concept known as option value. One of the reasons you are – or were – willing to pay $17 for a CD is that you can listen to it whenever you want, as many times as you want. With radio, you don't pay a cent but you don't have any choice of when your favorite song plays. Napster destroys option value, letting you listen for free to whatever you want right now (Greenfeld K.T. 2000).

However, regardless of accusations regarding breach of copyright laws, Napster always claimed it wanted to help people sell more CDs. 'This is new territory for lots of people, and new laws are going to be made surrounding these issues. The last thing we want to do is to piss off artists,' said Napster's Richardson. 'We believe [that] just like radio, the more people hear songs, the more they want [to] buy the CD' (Sullivan J. 1999).

Many people believe that Napster (supposedly robbing the industry of million of sales by allowing fans to trade sound files for free) has helped the industry to sell music. Such opinions are related to the fact that the download time required is quite substantial, especially with average speed connections (which represents the majority of the internet users).

> Even on a high-speed Internet connection, a three-to-four-minute song can take some time to download. Pulling down an entire album could take hours. It takes additional time to transfer files to a CD that can be played outside a personal computer (Selvin J. 2001).

The role of Napster seems to be more as a dispenser of free samples, like the radio, allowing people to test a song's appeal. 'Napster encouraged people to try new music they wouldn't necessarily spend money to check out' (Selvin J. 2001).

The Napster example brings forward the concept of a new service, or system of services, providing and facilitating new opportunities and markets in an industry.

> Music retailers have found that artists like Beck and the Beastie Boys, who release an MP3 often, see a spike in their album sales, according to Ms. Richardson. Napster could grab a piece of those sales if it offered albums on its site, so the company is considering forming an e-commerce partnership to let Napster users buy the music they like without hopping to an e-tailer (Landry J. 2000).

Aram Sennreich, an analyst for Jupiter Communications, highlights the major impact that a company like Napster can have on the market: 'nowadays, instead of selling consumers a CD, what you're actually going to be selling consumers is the permission to listen to a song or to listen to an album and that's a huge difference' (Potter N. 2000).

The combination of peer-to-peer exchange of music files and cheap CD burners has created the conditions for a PSS. In this case, the end user now makes the product. If we apply a similar methodology to the publishing and printing industry, the various agents have to shift their focus and redesign their roles and modes of operation. As previously mentioned, an important aspect of such shifts is that new roles can emerge producing unexpected figures proffering unexpected solutions.

Both Napster's and the mobile phone providers' experiences provide us with insights into how customer behaviour may change and how these changes may influence future expectations. These experiences show also how new markets can evolve as a consequence of such proactive and innovative strategies. These insights can be applied to the printing and publishing industries to create new mindsets.

SOME KEY POINTS TO CONSIDER ARE:

Products are dematerialising. In our specific case, the content rather than the book itself should be the focus for printers and publishers.

- People's modes of conceiving information have changed. The case of Napster shows how the opportunity to listen to, rather than own, is the user's concern. In the same way, people want to communicate via a handset. A similar conclusion could be traced regarding the book industry: people want to read.

- People's sense of community plays an important role in determining the success of, and interest in, a certain product. People have an active role in the market and require the opportunity to share, trade and modify information.
- People need to see (or listen to) something to understand if it addresses their needs. Napster has been interpreted as a dispenser of free samples where people can try and decide what is suitable and what is not. The role of spaces where customers can view and try a potential purchase cannot be underestimated.
- People have various ways of accessing information. Someone for example prefers to buy a CD, other users might be more comfortable with an MP3 file downloaded on their player, and others like to listen to the radio. Users have a wide variety of needs and perceptions. Similar reflections can be applied to the book.
- Finally, consumer requirements for space and access can be diverse. One can have the need to read on a tram rather than at home. Now or tomorrow. Increasingly, people want to access information in easier and faster ways.

A POSSIBLE SCENARIO

The purpose of this section is to provide a possible landscape, or scenario, that represents the outcome of our earlier reflections.

Dematerialisation, the shift to Product Service Systems, the modes of reading and of accessing content, and a reinterpretation of existing infrastructure and the products and services that relate to that infrastructure combine to create one of many possible scenarios. As all future scenarios are speculative, the reader should think in terms of possibilities, key issues for reflection, and potentialities – this is the shift in mindset that we are advocating.

To make this scenario easier to read, four possible reader-spaces, or settings, are outlined. Following these outlines, some fictional users (based on the classification mentioned in a previous section) are adopted to describe possible ways a reader might navigate in this scenario.

1. THE SHOWROOM

There are no bookshops. There are book-sample expositions and knowledge providers where a customer can view what is available, and open a contract to access information. Ebook readers are provided free of charge as part of the contract. If users want more powerful readers, an extra fee is levied. Information is graded in terms of *points*, which are attached to a specific text and vary on the basis of:

- Format (text only, text with images, printable text);
- The time you want to keep the information (4 hours, 2 weeks, 1 month, 1 year, forever);
- The period in which the text was written ('Alice in Wonderland' or the latest murder mystery);
- Author (local writer or famous author);
- Publisher (e.g. Penguin or Phaidon).

The contract gives you access to a certain amount of points per month and you use them as you like. You can decide to pay more and have more points to use.

In these knowledge showrooms there are print-on-demand facilities or the opportunity to be directly linked with print-on-demand providers. As people may want different formats of their printed copies, the showroom has samples of different modes of printing: with more or less expensive paper, paperback or hardback, B/W or colour.

2. THE LIBRARIES

In the library there are kiosks that provide information regarding authors, summaries of available etexts, details on what titles users have read, reviews by experts or by other readers (as with Amazon.com), information on languages available, on formats (text, video, voice).

The library has devices available for borrowing. Download points are provided where users can select and download the titles in which they are interested.

3. THE STREETS

In each suburb, there is a kiosk where people can view what is available, various provider deals, addresses of showrooms and libraries and so on. It is possible to use these kiosks as downloading points for people with ebook readers and contracts. Users can either pay using their available points (they have an ID and a password to access the system) or they pay by credit card.

4. THE NET

Over the Net, publishers provide their downloadable texts. Some portals can be used as entry points to a wide range of offers and providers. People can download information, choosing the mode they prefer. The opportunity to have a print-on-demand facility is offered as publishers have links with printing industries.

USERS

In this section, we provide examples of how a user could eventually navigate within the described scenario. To do so, imaginary users have been created as a means to demonstrate possible movements, gestures, ways of reading and modes of reading within the scenario.

I Want To Own That Book – The Case Of Araminta, A Photographer

Araminta is a photographer. She loves the touch of the expensive paper on which coloured images have been printed. She has a huge collection of books about photography and every now and then she likes to flick through the pages of one of her possessions. Some of the books are on her coffee table are almost ornamental. When Araminta decides to buy a book, she really means it. She needs to own it.

Araminta generally checks on the Net for the latest publications, and then she visits a showroom to see and touch her possible purchase. She generally uses the showroom as a tangible point of information about what she wants. She chooses the paper and format she likes, takes some notes about the relative codes and then contacts a print-on-demand provider through the Net. She pays by credit card and her new item is delivered directly to her home.

I Need That Information – The Case Of Chen, A Student

Chen is from Beijing. He is an undergraduate student in organizational culture and management. Chen needs to access information quickly and at low cost. He also needs up-to-date information for his assignments. He works mainly on computers available through the university and searches the net on a daily basis. Once an assignment is finished it is quite unlikely that he will need the same information again.

Through the net, Chen downloads the papers, articles, chapters or books he needs. He pays by credit card for the right to use them for a limited amount of time, even though downloads are often available free of charge from the university library. The library has an agreement with publishers to use the information. They are charged a yearly fee that is calculated on the amount of accesses per year.

I Want To Own That Information – The Case Of Sally, A Traveller And Eco-Journalist

Sally is always on the move. She works as a freelance journalist and travels continuously to be where events occur. She needs good travel guides and also the chance to access specific information on the spot. Sally has her own ebook reader that allows her to be a *light traveller.*

Sally generally downloads the relevant travel guide either from the airport of departure or arrival, as both are equipped with kiosks. Sometimes she gets her information directly from the street kiosks. Because of the nature of her job, she often needs detailed information on a specific issue, such as data regarding a country's policies in terms of environmental issues or statistical comparisons.

To Sally, it is important to keep all her guides and information booklets ready to be read and updated in her device. She needs information on the spot and quickly. She therefore prefers to pay a fee in order to keep the information in her laptop and to update it on a constant basis.

Some magazines prefer to have a printed copy of her material as well as a digital copy, and sometimes Sally likes to send a copy of her latest article to her mother (often on the other side of the world). Sally generally contacts her net-based print-on-demand

provider and asks to print and send the material of her behalf. She generally pays by credit card.

I Want To Modify That Information – The Case Of Dr. Kohler, A Researcher

Dr. Kohler is an academic. He writes for journals and his research requires that he constantly refer to the published work of other academics. He generally downloads a series of papers, puts them in word processing format and starts playing around with the material, editing it, adding his perspectives, side notes and comments. He links specific paragraphs with others and so on.

Sometimes Dr. Kohler has sudden intuitions, quite often not in his office. He has his personal reader/editor with him at all times. He opened a special account at his local showroom and got a special reader with a special high-use contract and editorial options.

As he likes walking around and observing the world as an inspirational source, Dr. Kohler often downloads material from street kiosks when he has a need.

He loves the chance to work in open and public spaces and with the help of his device and contract, he can access information when he likes, as he likes and where he likes.

I Want To Link That Piece Of Information To Other Information – The Case Of Laura, Critical Writer

Laura searches information and often needs to find specific segments of information. Sometimes she remembers the name of an author, but not the title of the book. She generally uses her local library facilities. They have a kiosk that allows linking across the collection. Laura generally searches for information, borrows a reader from the library and then downloads all the material so that she can work on it later at home.

I Want To Share Information With… – The Case Of Mr. Bantok, Pensioner

Mr Bantok's grandchildren live in the city while Mr Bantok lives in the country. He loves his grandchildren and misses them greatly. He wants to stay connected with them in more than ephemeral ways. Mr Bantok is an assiduous library user, and he uses the facilities to

download and edit the written and visual content that he shares with his grandchildren.

This includes stories that are constructed from visual, textual or sound-based bytes that he packages for his grandchildren on a Reader/Editor that he borrows from the library. Then he sends these stories via the net. Some of these content-bytes he has paid for, other bytes were available from the library free of charge.

Mr Bantok has a network of friends who share an interest in model planes. He downloads plans and descriptions, and makes comments on the side. He then shares these modified, customised, and notated plans with his friends.

HOW CAN WE ACCOMMODATE NEW SCENARIOS?

It is quite clear that a shift toward an understanding of what a user wants from a text is vital. The above-described scenarios and possible navigations according to users' needs demonstrate the necessity of such a shift in mindset.

For scenarios like this to develop, several shifts need to occur.

- **Printers** should start considering alternative modes of operation in the market, looking for ways outside traditional frames. Because of static capital investment, printers cannot procrastinate any longer. They need to explore avenues that might lead towards new markets. They need to find alternative ways of operating and of utilizing their capital and the structures and infrastructure that support this capital.
- **Print-on-demand** should be read as an excellent opportunity to explore and lead, once a shift in mindset occurs.
- **Publishers** need to modify their 'territorial' thinking and open up collaborative opportunities with other stakeholders. It is not a matter of losing markets or controlling content, but a matter of gaining new markets, exploring different layers of control, and finding alternative ways of interpreting and delivering content.
- A redefinition of the publisher's role implies the creation of new relationships with their end users and potential partners. Such relationships and the relative interfaces between various actors need to be properly addressed, designed, and implemented.

- **Retailers** and **libraries** will be required to shift their mindset as well to be part of an efficient system of products, services, modes of interacting and using content.
- One of the conditions necessary for such mindset shifts and emergence new markets is the creation of a **network** on a **macro-scale**, which links various players. Such macro-networks can occur only if territorial thinking is abandoned or, better still, re-interpreted in a non-traditional/non-competitive ways.
- The role of government regulations within such scenarios is crucial. Governments can act as 'triggers' igniting the beginning of new strategies and modes of operation, as demonstrated by the Californian *Zero Emission Vehicles* requirements.
- Several institutions or associations are experimenting with new ways of linking entire segments of the industry to provide new services and redefine the boundaries of those services. In the following section the example of Lightning Source is provided.

CASE STUDY – LIGHTING SOURCE

In this section we analyse the case of Lighting Source as a means to demonstrate that it is possible to shift towards a more flexible and service-oriented strategy and that it is possible to link various agents in different ways.

Lighting Source, initially known as Lightning Print Inc., was originally a member of the Ingram Book when the print-on-demand business was established in 1997.[14] In 2000 the company expanded its suite of services becoming Lightning Source Inc.

The Lightning Source website declares on its first page both its aims and orientation within the marketplace:

> Lightning Source Inc., a subsidiary of Ingram Industries Inc., offers a package of digital fulfilment and printing services to the book industry. Whether it's our print-on-demand capabilities or our ebook services providing high-volume, comprehensive delivery opportunities, Lightning Source is *The Digital Content Connection.* Lightning Source has a unique combination of publishing knowledge, success in print-on-demand, and digital fulfilment capability, and we intend to maintain our position at the forefront of this ever-changing marketplace. This approach will allow customers to: Increase sales profitability, access

[14] Headquartered in LaVergne, Tennessee. Satellite facilities are planned for the West Coast in the fourth quarter of 2000 and for in the UK the first quarter of 2001.

> quick, easy solutions, meet evolving customer needs (Lightning Source 2001).[15]

Lightning Source represents an exemplar of how the printing and publishing industry can reassess its potential, create and engage in new challenges and 'exploit' the wide-ranging opportunities offered by new technologies.

Stan Gundry, (Vice President and Editor-in-Chief, Zondervan Publishing House) reflects on the benefits of new technologies and on the changes of the relationship between industry and end user: 'Today's global marketplace is undergoing revolutionary changes with technology unlocking the door to exciting new opportunities for both the book industry and consumers'. He points out the importance and potential of new systems of services and products within the sector: 'In this ever-changing environment, the possibilities are endless. Rapidly developing technologies and innovations provide publishers, booksellers and libraries new ways to meet evolving consumer demands'. He sees the value of new technologies as successful modes by which the market can be regenerated and implemented:

> Lightning Source built its reputation by capitalizing on new technology, delivering successful *on demand* printing services to market. The company brings that same innovation to the e-marketplace. With an expanded suite of services, we now offer a complete digital fulfilment package to publishers, booksellers and libraries (Lightning Source 2001).

Lightning Source provides:

- print-on-demand printing and distribution;
- print-on-demand drop-shipping;
- short-run printing;
- galley printing;
- complete digital fulfilment, including file conversion, content management and storage, digital rights management, and;[16]
- secure ebook delivery.

Also, it clarifies the benefits and suites of services it provides to booksellers, publishers and libraries that play a key role in the company's system (refer to the following tables).

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[15] http://www.lightningsource.com/

[16] Including file conversion, content management and storage, digital rights management (DRM), secure ebook delivery, and distribution of printed 'on demand' books.

	Benefits	Ways to achieve benefits
Booksellers	Increase Sales & profitability	Keep more books in print including regional sellers Bring back out-of-print titles Facilitate market for foreign language publications in the U.S.
	Access Quick, Easy Solutions	48-hour turnaround to the distributor on print-on-demand orders Immediate download service available for ebooks Hassle-free approach – relationship with Ingram Book Group and other wholesale distributors allows you to simply add Lightning Source 'on demand' titles to your existing order
	Meet Evolving Customer Needs	Variety of reading formats to serve range of customer needs ebook capability to meet high-tech consumer demand Guaranteed quality finished product

Benefits for booksellers (Lightning Source 2001)

	Benefits	Ways to achieve benefits
Publishers	Increase Book Sales	Keep more books in print Bring back out-of-print titles Test-market new titles Expand opportunity for ebook sales
	Maximize Profitability	No capital tied up in slow-moving inventory No shipping and handling costs Reduced ordering and administrative costs No costly overstocks No missed sales
	Access Quick, Easy Solutions	48-hour turnaround on print-on-demand titles Immediate download service available for ebooks Drop-ship fulfilment options Comprehensive digital fulfilment services including file conversion, digital rights management and content delivery in multiple device formats Hassle-free approach to ebook sales
	Meet Evolving Customer Needs	Variety of reading formats to serve range of retail needs ebook capability to meet high-tech consumer demand Print-on-demand titles available in either hardcover or trade paperback, including new hardcover options with colour jackets

Benefits for publishers (Lightning Source 2001)

	Benefits	Ways to achieve benefits
Libraries	Access Quick, Easy Solutions	One of the largest digital libraries available today with over 15,000 titles, growing by an average of 400/week Commitments from publishers to add another 50,000 titles 48-hour turnaround on print-on-demand titles

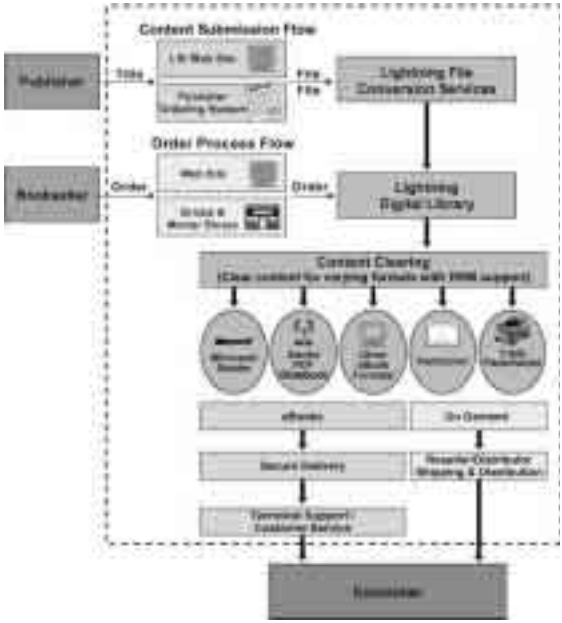
	Meet Evolving Patron Needs	Variety of reading formats available – from ebooks to hardcovers to trade paperbacks ebook capability to help you meet growing, high-tech consumer demands Guaranteed quality finished products
	Receive the Same Dependable Service You've Come to Expect	Established reputation of quality service to both library and book publishing communities Strong track record of success with over 1.3 million 'on demand' books printed to date and more than 700 publishing partners Hassle-free approach to ordering

Benefits for libraries (Lightning Source 2001)

The company relies on its 'innovative digital fulfilment system (see Figure 14) that promises to revolutionize the options available to the industry in the conversion, storage, management and distribution of digital content' (Lightning Source 2001).

Lighting Source provides figures stating that it is one of the largest digital libraries in the industry 'with more than 15,000 titles and the commitments to add another 50,000' and that more than 1.3 million on-demand-books have been printed to date (Lightning Source 2001).

Its publishing partners include Holtzbrinck, Penguin Putnam, Simon & Schuster, and Time Warner and it has alliances with major technology providers including Adobe, Glassbook, IBM, Microsoft and Versaware.



Lighting Source, fulfilment chart

This company has clearly understood changes in the printing and publishing market due to new technologies and the modifications in people's perceptions and needs within this sector. Moreover, Lighting Source has understood the need to link, at a macro level, all the industry players in a central node capable of coordinating interfaces, flow of information and expertise, and multi-faceted market demands.

Technology within this scenario is not an *enemy* or something that can slow down a process, but instead a tool by which each segment of the industry can improve and fulfil its requirements. In this sense Lighting Source is a Product-service System 'connector'.[17]

> New technology has fundamentally changed the way people access and read books. As the book industry continues to evolve in this fast-paced, demanding world, Lightning Source provides essential services for both print-on-demand and ebook fulfilment. We handle the technology so publishers, booksellers and libraries can concentrate on what they do

[17] As a matter of fact its subtitle is 'the digital content connection'.

> best. Lightning Source provides comprehensive end-to-end digital fulfilment services. These range from file conversion to content management and storage, from digital rights management to secure ebook delivery and distribution of printed 'on demand' books. A title can be delivered any time, anywhere in any available format. This is made possible by the transparent infrastructure Lightning Source provides (Lightning Source 2001).

There are several examples of other industry 'connectors' or 'providers'. Some publishers are providing value added services for authors (editorial, marketing, communities of writers, etc.) and readers.

- **Xlibris**, for example, provides suites of publishing services (as the Online Publishing Kit and the Marketing Pro Kit) to help users to publish their own book.[18]
- **Ebook Connection** provides a wide-range of service related to ebook use, including Reading Software, Authors' Room, ePub Market Updates, ebook Best Seller List, Reader Connections, and ePublisher Links.[19]
- **Reed Elsevier**, claiming to be 'a world leading provider of information driven services and solutions' is perhaps one of the most debated cases.[20]

Other examples are **e-globallibrary,**[21] **Questia,**[22] **eBrary,**[23] and **NetLibrary.**[24]

CONCLUSION

As discussed in this chapter, the printing and publishing industry is in a critical and challenging transitional period, where the potential for renovation, redesign and refocus is in the hands of those in the industry.

Such a situation requires a shift from the traditional book-mindset to content-provision thinking. Various industry players need to rethink their role within the many possible scenarios shaped by new technologies and to develop strategies for a changed market.

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[18] http://www.xlibris.com/
[19] http://www.ebookconnections.com/
[20] http://www.reed-elsevier.com/
[21] http://www.e-globallibrary.com/
[22] http://www.questia.com/
[23] http://www.ebrary.com/
[24] http://www.netlibrary.com/

We are likely to see the emergence of transactional models where the consumer pays to *use* rather than to *own* a product. Publishers need to consider such models for the sale and distribution of their precious content and to capitalise on existing skills and capabilities. We recommend that those in the industry set about creating macro-frameworks capable of connecting the various players under a shared umbrella. Such thinking would benefit the agents in that it would allow new strategies and consequent alliances to emerge. Governments can play a role in this framework through changes in regulations and policies.

Finally, the role, risks and potential benefits associated with copyright issues within a PSS orientation need to be highlighted. Copyright concerns and strategies can direct the development of a system in very specific ways. Copyright can be interpreted either as a trigger or as a constraint in the development of a Product Service System.

We believe that there may be two immediate triggers for change:

- Government regulations and policies in response to copyright pressure, and;
- Entrepreneurs acting to create new models that consequently trigger copyright and government action.

In the first example, policies are based on existing sets of problems (and therefore are relatively predictable). In the second, example policies are generated because of the actions of entrepreneurial companies that lead to unpredictable problems, consequences, and solutions.

The California ZEV regulation seems to belong to the first example, whereas the Napster case belongs to the second. It seems just a matter of time before one or the other scenario unfolds. The example of Lightning Source indicates that entrepreneurs are already active. Players in the Australian publishing and printing industry cannot afford to wait and see what others will do – by this time it may be too late.

A new orientation toward Product Service Systems could allow the printing and publishing industries to lead the market, capitalising on the potential of new technologies to create new markets, roles and alliances.

Publishers will need to accommodate a variety of product service approaches, including hybrid mixes that bring digital text to the reader in ways that may or may not depend on a physical product.

From the perspective of a publisher, the re-conceptualization of the publishing process as a PSS lends itself to a transactional model, where knowledge and information can be exchanged for payment or goodwill.

A shift in mindset will enable publishers to continue to be part of, and integral to, the publishing, distribution and sale of text. Such changes are possible, sustainable, and recommended, as some pioneers are already demonstrating through their innovative ways of operating.

A shift in mindset can make such changes possible.

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