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E-Business@Print

Internet-Based Services and Processes

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Internet-Based Services and Processes

With 91 Figures and 4 Tables

Springer

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Preface

The ship shears on through billowing seas
Carried on tempest's wings with ease
A cry of joy goes up from fore and aft:
"Our destination is within our grasp!"
But the helmsman's words are lost in the throng:
"We've been sailing in circles all along."
Marie von Ebner-Eschenbach

This book has been written as an aid to anyone in the print media industry, be they managers or customers, who is looking to steer their business into calmer waters in what are stormy times. New technologies offer tremendous opportunities for innovation and process improvement – but only if we understand the fundamental principles behind them. This is the goal of this book.

To this end, we will be looking at how best to network the print media industry with its customers, production partners and suppliers.

This networking process covers the production data that can be transferred entirely digitally as far as the press stage, i. e. the digital page to be printed (referred to below as the "technical workflow"), but also the information, communication and interaction processes which take place before, during and after production, e. g. details of the print run or the planned delivery date (referred to below as the "business management workflow").

Inter-company networking of the various market players using Internet technology is known as "e-business" in commercial and management circles.

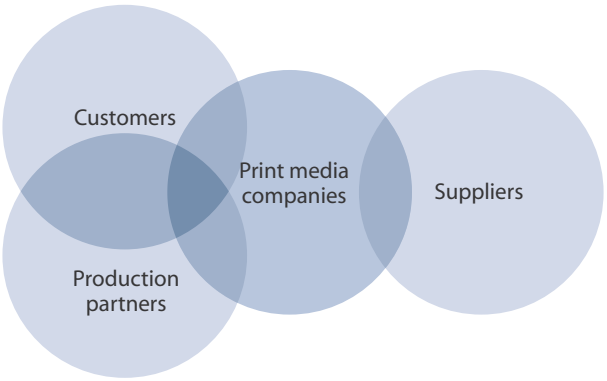


Figure 1
Persons involved in a production process

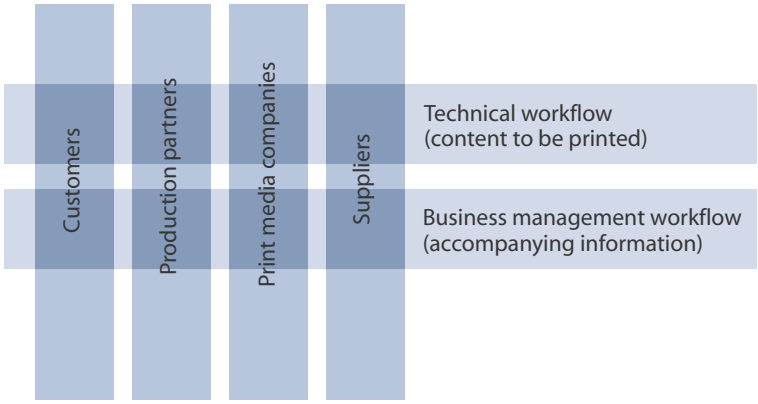


Figure 2
Inter-company networking

There are three ways of looking at e-business in the print media industry:

- From the perspective of the print media company which supplies both paper-based and Internet-based media products – and thereby generates additional sales through e-business (new products and services);
- From the perspective of customers of print media companies who are interested in enhancing cooperation with their service providers (process innovation for cutting customer costs) and
- From the perspective of the print media company which uses e-business to improve its own marketing, sales, production and purchasing operations (process innovation to cut costs in print media businesses).

This book provides an overview of all three of these perspectives. Following an introduction covering the basic concepts of e-business, Chapter 1 will look at *new products and services* that print media businesses can offer their customers for their e-business operations. This chapter provides decision makers in printing businesses with an overview of possible product innovations. Customers of print media businesses will also find it useful, since it sets out the services that they can expect from the print media industry in addition to pure and simple printing – often enabling them to reap considerable synergies to paper-based production.

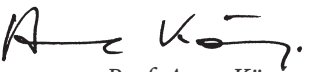
Chapter 2 – *Enhancing process efficiency by integrating customers in production* – focuses on the benefits of close cooperation with the customer. It puts forward solutions for how e-business can help customers and print media companies to cut process costs and work together more effectively.

Chapter 3 – *E-business for buyers* – looks at applications that help buyers to work more efficiently with multiple print media companies.

Chapter 4 – *E-business for printshops* – is targeted primarily at managers in print media businesses. It offers solutions for cutting process costs in marketing, sales and purchasing (procurement).

My aim in writing this book is to provide the reader with a comprehensive account of the solutions currently available. Where technologies are available on the market that help illustrate the fundamental concept being discussed, the supplier in question will be named, though no attempt will be made to evaluate the supplier. The question of which products or process innovations covered in this book should be used in a particular business depends very heavily on the company's job and customer structure. Consequently, it is virtually impossible to provide answers that apply to all cases. To illustrate this point, the very thought of using order tracking to enable customers to monitor the progress of his print job may sound absurd to some printers, particularly if they have less than six hours anyway to process a job. Another printer who is happy to give customers the means to make changes while print production is in progress can strengthen his market position considerably by using such technology. Once again, some print companies may consider the move to becoming a "cross-media company" a key strategic element, while others may take quite the opposite view.

I should like to express my sincere gratitude to the students of the Printing and Media Technology program at the University of Applied Sciences Berlin, Germany, for their assistance in researching this book. Details of this program can be found online at www.tfh-berlin.de/~dmt.



Berlin, February 2005

Prof. Anne König
TFH University of Applied Sciences Berlin

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Introduction

E-business, M-commerce & Co. – An Explanation of the Terms

E-business (electronic business) is the provision of electronic support for all business, interactive and communication processes between the various market players using electronic networks.

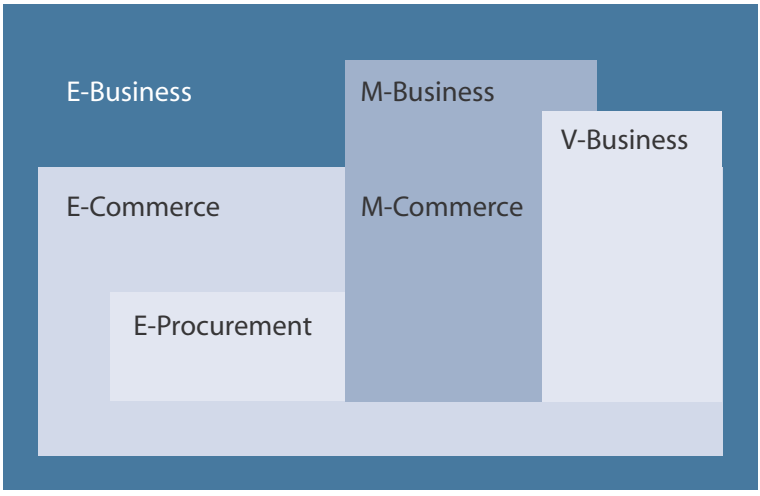


Figure 3
Classification of the various forms of electronic business

Based on this definition, the other terms listed in Figure 3 all form subsets of e-business:

- E-commerce (electronic commerce), a subset of e-business, embraces all sales and purchases via electronic networks – by both private and business customers.
- E-procurement (electronic procurement), a subset of e-commerce, relates to support for purchases among business customers.

- M-business (mobile business) focuses on business, interactive and communication processes which take place via mobile terminals (cell phones, personal organizers and notepads).
- The term 'm-commerce' (mobile commerce) is used for purchases made via mobile terminals (e. g. purchasing drinks using a cell phone).
- V-business (voice business) covers all e-business activities made via voice input and output. In addition to the Internet and mobile terminals, the traditional telephone also has a key role to play in the "electronic network" (e. g. use of a telephone to access a database containing the latest stock exchange information).

This explanation of the various terms provides a useful basis for categorizing additional new expressions:

- E-logistics covers all e-business activities that can be used to control delivery chains via electronic networks.
- E-recruitment (electronic recruitment) endeavors to make staff application and selection processes more efficient by using electronic networks.
- E-government embraces all the activities of public administrations geared towards making greater use of the Internet for administrative processes.

A second structuring level in e-business is based on the market players themselves (cf. Figure 4).

If the party providing information or goods is a business and the customer is an end user, this is known as a B2C ("Business-to-Consumer") transaction. If both the supplier and the customer are businesses, this is a B2B ("Business-to-Business") transaction. The printing industry is a classical supplier of B2B products and services, since private customers account for only 2% of sales. By contrast, publishing houses who for the most part deliver magazines directly to end users are classical B2C suppliers.

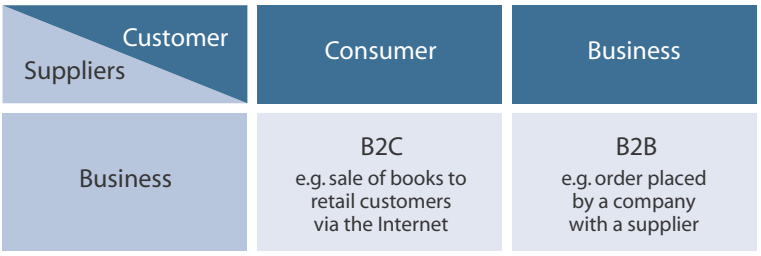


Figure 4
Structuring e-business as a function of the market players

This distinction is more than just purely theoretical. Communicating with end users who are generally anonymous involves quite different procedures to communicating with business customers who will usually be known.

1 New Products and Services

1.1 Concentrate on Print or Develop into a Cross-media Service Provider – a Strategic Decision

As a branch of the communications industry, the print media sector supplies customers with products and services covering every aspect of communication. Since the advent of e-business, communication with consumers, but also with business partners and customers, has been taking place increasingly via the Internet. It therefore seems logical to investigate the extent to which communication via the medium of paper should now be augmented by digital communication media in the printshop's product portfolio. Such a move requires not only the creation of an actual Internet presence (i. e. a website), but also the provision of Internet-based services such as the creation and management of a database – a step that inevitably involves costs. This then turns the printshop into a qutprint media business.

E-business naturally also poses a significant risk to the print industry, since a number of paper-based communication products are being replaced by electronic media. Industry catalogs illustrate this point well. To an ever-greater extent, these are now only being produced in digital form as part of Internet-based procurement processes. But at the same time, industry catalogs are also a good example of how the print industry can make full use of synergies by providing customers with both print products and electronic media in parallel – a process that is known as cross-media publishing – and thereby become the customer's preferred supplier for e-business solutions too.

The debate as to whether a printshop should or should not expand its portfolio to include multimedia services kicked off in the mid-1990s. At that time, the Fraunhofer-Institut für Ar-

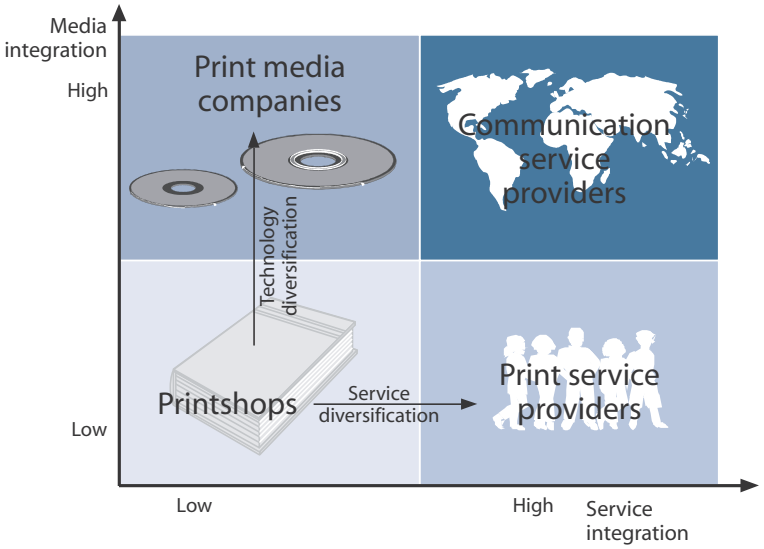


Figure 5
Strategic possibilities for developing a printshop

beitswirtschaft und Organisation IAO (Fraunhofer Institute for Industrial Engineering IAO) in Stuttgart, Germany, developed a model which, in a somewhat modified form, still applies today (cf. Figure 5).

It follows from this model that printshops can grow in four ways:

1. Growth in the "print" sector – this route is chosen primarily by large printers eager to win the price battle for certain print products and looking to grow sales on both a supra-regional and international level.
2. "Service integration": Growth through integrating new services upstream and downstream of the print stage, e. g. letter services, warehouse management or print-on-demand. The printshop develops into a service provider.
3. "Media integration": Growth is achieved by extending the product portfolio to include media output on-screen. This includes development of websites, integration of moving images and, in many cases, development of small software modules. The printshop becomes a "print media business".
4. Service and media integration can be pursued in parallel, with the different elements being integrated to different degrees. The printshop becomes a "communications service provider".

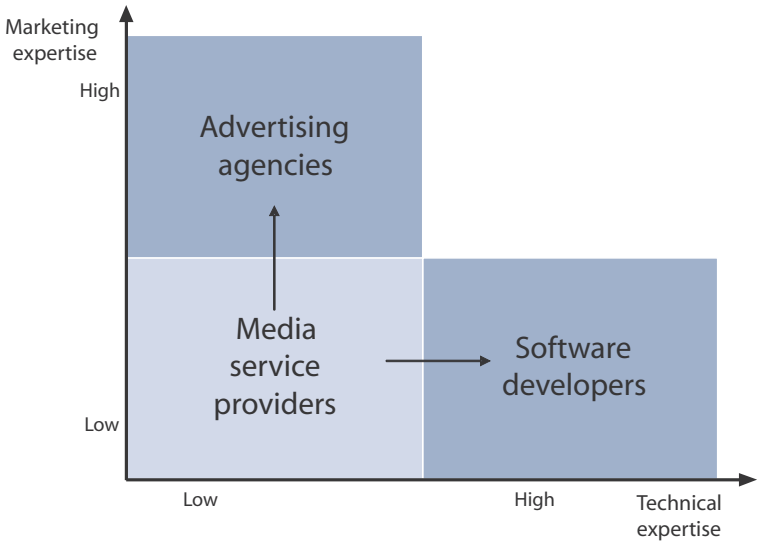


Figure 6
The strategic options of a media service provider – focus on marketing or focus on technology

In adopting media integration, the print industry is not moving into uncharted waters, but is merely entering into competition with existing industries, namely advertising agencies, multimedia service providers and software houses. Recent years have seen numerous providers of multimedia services enter the market – some of them leaving just as quickly as they arrived. "Of the over 3,300 agencies on the market only just under 3,000 have survived", writes Jan Brune in iBusiness Executive Summary 3/2003, commenting on the success of multimedia agencies in Germany. The situation globally is similar.

It is a decision that print companies therefore must consider carefully. In particular they need to ask themselves two strategic questions:

- Should the company offer its services based on its creative expertise (and thus move into the market served by advertising agencies) or its software know-how (cf. Figure 6).
- In what areas can synergies with the company's print expertise – "cross-media" – be expected to deliver the highest rewards over the long term?

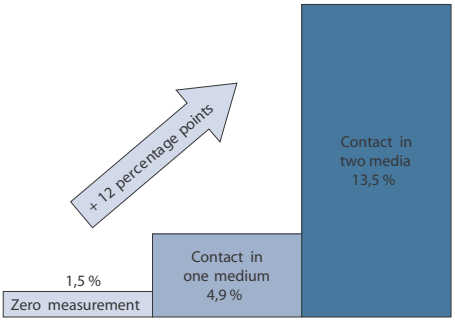
Cross-media

When a company uses different media to convey the same content, this is referred to as "cross-media". Cross-media is thus an important consideration when devising multi-media advertising campaigns and researching into their impact, but technical aspects also need to be factored in when using the same data for different output media.

If we ask ourselves which areas can best achieve synergies with printing expertise, this inevitably leads on to a further question: Do customers actually need synergies with their printing operations? Research work into media impact is quite conclusive in this respect. Yes, they do. Practically all the studies conducted in these fields confirm that cross-media campaigns achieve higher brand recognition than campaigns that focus on only one or a few media. This is particularly true when marketing consumer goods.

One study that is particularly well known is the "Alfa-Romeo test" conducted in 2003 which measured the effectiveness of parallel online and print advertising. The campaign was targeted at women between the ages of 25 and 39. 40% of the advertising budget was allocated to print media (women's magazines), 8% to online advertising on these magazines' websites, and the remaining 52% to TV ads. All indicators – Figure 7 shows the unaided recall responses – deliver far better results for online and print advertising combined than for print alone or online alone.

When a printshop is considering expanding its portfolio to include the development of digital media services, it is important to remember that the "new media" market is looking for more



- The respondents that had contact with **print and online** generated much better unaided recall responses to the Alfa Romeo advertising than the groups that had come into contact with only one medium.
- The unaided recall responses in this case were almost **three times** higher than the group that had contact with only one medium .

Figure 7
Effect of combined print and online advertising compared with single-medium advertising. Extract from Alfa-Romeo test[1]

[1] Joint study by TOMORROW FOCUS AG and G+J Electronic Media Sales GmbH. Online: http://www.dihk.de/inhalt/download/alfaromeotest.pdf [accessed 23.08.2004]

than just cost-effective, high-quality products delivered on time. Customers nowadays also expect:

- Greater flexibility in the production process (enabling last-minute changes);
- Customized production procedures (including runs as low as 1) and
- Customer-integrated production (the customer is involved in parts of the production process).

This third point is particularly relevant for website services, which are discussed below as the first new offering from printshops looking to position themselves on the market as media service providers.

1.2 Developing and Maintaining a Website

Virtually every company today has a website and a number of printshops have extended their portfolio to include services for designing, maintaining and re-designing websites.

Depending on the customer's field of business, the website will need to meet specific requirements and the media service provider will thus have to offer specific expertise. Some customers prefer to use their websites as a vehicle for introducing their business to potential new clients. Others want to use it to sell goods over the Internet, while others again may want to incorporate interactive elements to personalize their offerings.

Where printshops include website development in their portfolios, they should check the extent to which customers can be encouraged to sign up for additional services once the work on the website has been completed, since repeat orders will generally be limited to redesign work. Customer-integrated production, in which the customer can update the content himself while the media service provider creates new layout templates and carries out regular quality checks, can be used to generate continuous sales (cf. Section 1.8).

Focus on Information

Many customers, such as those in the manual trades, will want to focus on the company and what it does and will therefore be eager to market the website and make their company better known.

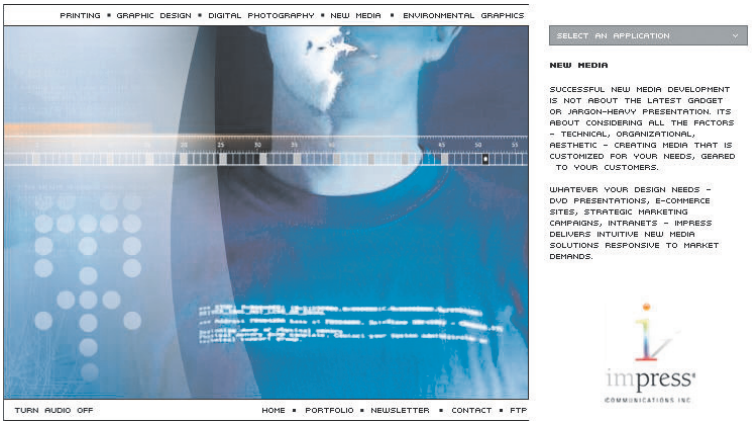


Figure 8
Summary of the product portfolio (New Media selected) of the Impress Communications printshop, Canoga Park, California
www.impress1.com

Services that a media company can provide include:

- Developing a concept for the website
- Website design
- Editorial support, translations
- Programming
- Development of a management interface that the customer can use to update the site himself
- Training in how to update the website
- Devising a concept for marketing the website
- Implementing the marketing concept (registering with search engines, banner advertising, positioning in portals)
- Consulting on security and legal issues

The projects will generally be one-off jobs, since customers will generally want to update their sites themselves.

Focus on Sales

Companies selling products will want a website built around an e-commerce system featuring a link to the company's ERP systems, in particular its merchandise information system (MIS).

E-commerce sytem

E-commerce systems are Web-based software packages that support the quotation and sales processes. They include catalog integration, generation of a shopping cart and support for the billing process using payment systems (e. g. credit cards).

ERP system

ERP system stands for "Enterprise Resources Planning System" and is the generic term for all industry-specific software solutions that support the quotation, order, production planning, material management, logistics and billing processes. In the print industry, ERP systems are known as "order management systems" or "industry-specific software". Major suppliers of ERP systems include SAP and Microsoft Navision.

E-commerce websites can be complex, particularly when sales portals are used to market the portfolios of multiple manufacturers. The e-commerce software then has to be standardized. A high level of IT expertise is required for integrating corporate databases.

Focus on Being Up-to-date

For companies dealing primarily with information, such as publishing houses, the ability to have their own staff update their website will often be a key consideration. This can only be achieved by using an editorial system (Content Management System, CMS).

Content Management System (CMS)

A CMS is a software package that enables multiple authors to change the content without requiring any knowledge of programming websites. Layout templates are provided for this purpose and a user management facility enables several persons to access the same website with ease.

The publishing house itself or a company that works with it closely will generally undertake the task of building and maintaining the publisher's websites. Print media service providers can advise on, set up and maintain CMS systems (cf. Section 1.5).

Focus on Interactivity

Interactive elements are used on websites when companies want to provide users with more than just static information and want to tailor the information to the user's specific inquiry or browsing behavior. A classic example of this is the form integrated into a website that is used for calculating the return on a savings account. The user simply fills this in, clicks the "Go" button and is then provided with his personalized investment proposals using a database-supported calculation.

These elements increase the level of service to the customer while simultaneously reducing the amount of administration for the company. They are often described as "customer self-service systems".

Services required for this type of website involve additional programming work.

1.3 Setting up and Expanding Databases and Safeguarding Availability Using Media Asset Management Systems

Databases such as the following are key elements in making the production process for media products more flexible and customized:

- Address databases for direct-mail campaigns
- Image databases for outputting images in various formats and resolutions for different printing processes or on-screen output
- Variable and static text and image elements for personalized collation of information for different customers or customer groups.

Databases have become a key production tool of the print media industry, particularly in digital printing. Database creation, provision and maintenance has also become a field of business in its own right that can be used for generating sales.

The term "Media Asset Management system" (MAM system) is used generically to describe databases that customers can access directly and which, in addition to the normal functions of image databases, also provide information about all aspects of images and incorporate billing systems.

"Asset" in a financial sense refers to the "financial assets" of a company. In e-business the word "asset" represents elements of

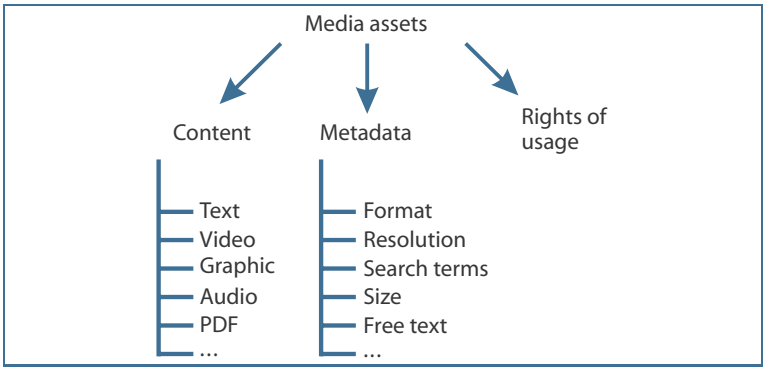


Figure 9
Elements of a media asset

the company's wealth that increase in value through their repeated use. Exploiting these assets is not just the task of personnel in the print media industry, it is also an integral part of the daily routine of customers' marketing and sales departments.

An asset is made up of various components – the actual content, the related metadata and access rights (cf. Fig. 9). Access rights can be defined either as rights to view and modify the content or as copyrights.

The media service provider can set up media asset databases for customers, manage these assets, provide the hardware and software required for output, and ensure that all of the customer's partners who have been granted right of access via the Internet can also use the data. Figure 10 uses the example of the Opix media database to illustrate the functions that could be supported by a MAM system, such as download options and targeted search filtering.

The key features of MAM systems, which grew out of image databases, include:

- Management of large volumes of data (images, graphics, audio and video modules)
- Web interfaces which also support access from outside the company
- Keywords and structured / unstructured search options
- Openness vis-à-vis specific output media (media neutrality)
- Management of access rights, possibly with integrated billing systems (content billing system).

Take the example of office requisites manufacturer B whose data is managed by media service provider M for a monthly fee dependent on the volume of data stored. The service provided also

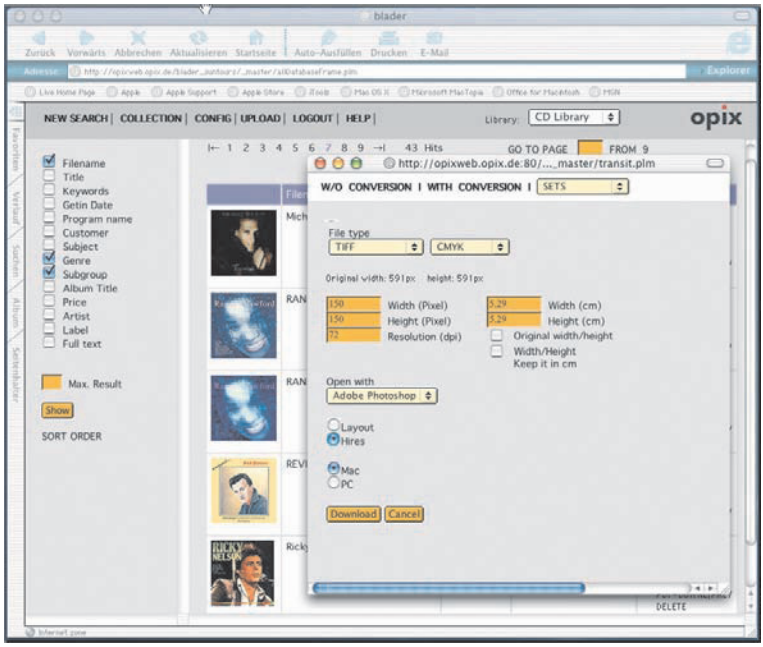


Figure 10
Examples of the functions of a Media Asset Management system
www.opix.de

includes structured keywording. In addition to the manufacturer himself, sales partners can also access the database online to generate regional leads. Content billing systems are used for billing purposes.

Content billing system

A content billing system provides a simple means of billing the use of content. The systems generally support different billing systems, for example subscriptions of limited duration or payment per accessed file, possibly dependent on data volume.

Media Asset Management systems, also known as cross-media databases, Digital Asset Management systems and media-neutral databases, have also proved very popular in the prepress departments of printshops that have no explicit strategy for integrating electronic products, since structured databases are essential for efficient prepress. Customers gain added value if they are able to access the database externally.

1.4
Database Publishing – Production from Databases

Database publishing combines variable content with predefined layouts and outputs this content for specific media (cf. Figure 11). Database publishing requires the use of a Media Asset Management system.

Output media are evolving all the time. It is now possible to personalize content and layout not just for printing and the Internet, but also for Personal Digital Assistants (PDA), cell phones, etc.

Personalization

When using personalization, the parts of the content relating to the addressee are changed within the overall run to generate a "run of 1".

Versioning

Versioning adapts the content to a specific target group in order, for example, to produce different regional and language versions of one and the same brochure.

Customizing

Customizing adapts the content to specific customer groups.

Database publishing employs variable data to create personalized products and can also be used to control multiple output media. This latter use is also known as "cross-media publishing".

In marketing its cross-media skills on its website, the Bernecker Mediengruppe in Germany highlights the advantage of using a "full-service provider" – namely the substantial savings in communication for the customer. The customer does not need to contact the printshop, prepress company, Internet agency and advertising agency individually and then set about coordinating them, but can harness the skills of a cross-media service provider instead.

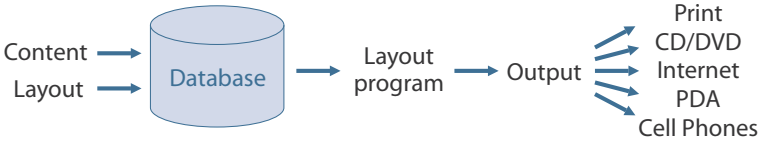


Figure 11
Basic principle of database publishing

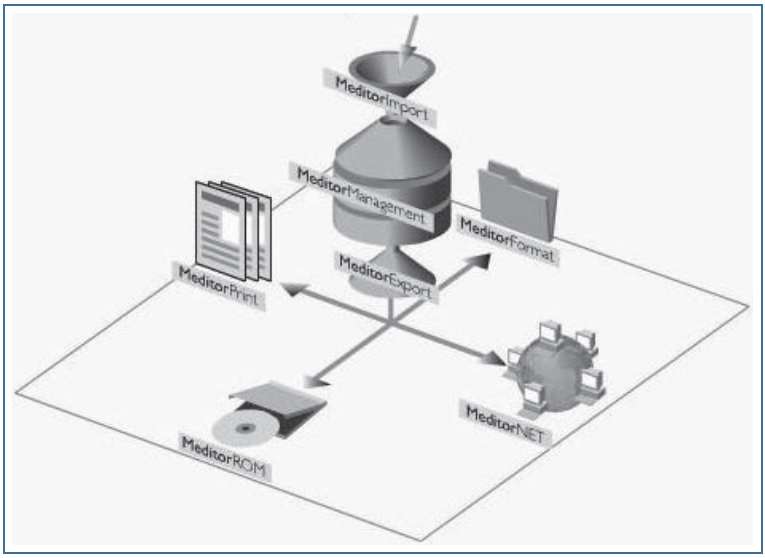


Figure 12
Summary of the cross-media output options offered by a full-service provider
www.bernecker.de

The Bernecker Mediengruppe uses a special software package for its cross-media projects which it can use to generate the various output formats (cf. Figure 12). MeditorPrint is the term used for the print-optimized output format, MeditorROM for output to CD-ROM, MeditorNET for Internet-optimized output and MeditorFormat for specialist catalog output formats.

In both cases, layout and content must be kept apart. From a technical perspective, this is increasingly being achieved using

Figure 13
Sample description of the "Database publishing service portfolio"
www.abt-medien.de

XML (Extensible Markup Language), a subset of SGML (Standard Generalized Markup Language) (cf. details of data formats in Section 2.1. Data output in the form of XML documents can be prepared for different media using XSL (Extensible Stylesheet Language) templates. The layout program is linked directly to the database in order to automate typesetting and makeup.

Catalog production has always been one of the most important applications for database publishing in the print sector. It is important for efficient production that databases are integrated into the production process – and this is particularly true when prices need to be included.

A second field of application has been opened up by digital printing, namely Printing-on-Demand (PoD). The primary difference between a digital printing press and an offset press from an business management perspective lies in the fact that the digital press does not involve any fixed makeready costs. A "run of 1" is realistic – and there are more and more applications where very small runs are cost-effective.

PoD

PoD stands for "Printing-on-Demand" – the normal scenario for the printing industry. It involves producing printed matter at the precise time and in the precise quantities required ("just in time", JIT). No storage is required.

Book on Demand

The term "Book on Demand" is a subset of PoD and is used for the production of books in small quantities only after they have been sold.

Take the example of a supplier to the automotive industry, let's say a manufacturer of brake systems, who has to supply extensive technical documentation to its customer, e. g. DaimlerChrysler, that needs to be updated frequently. To make this process more efficient, the media service provider has developed a PoD solution for this customer which employs a central database to store all the documentation for the individual elements of the brake systems, classified according to layouts and content modules. When a brake system needs to be supplied, a member of the shipping department selects the components for the documentation using the password-protected online facility and defines the output medium (CD-ROM,

paper, Internet). The layout program collates and prints the document and/or creates a CD-ROM – the documentation is produced JIT using the digital printing process.

At this point, the reader may be wondering where exactly printing takes place – directly at the brake system manufacturer or on the digital press at the print media company?

This depends on the size of the brake system manufacturer – but in principle the digital press could just as well be located at the manufacturer's. Why?

To find out, let's take a look in the production bays. Like every print media company, industry has to meet the demand for greater flexibility (last minute changes) and individualization (runs down to 1) in production. What brake system is used when, with what specification and in what quantities are all factors that are decided at ever shorter intervals by the brake system manufacturer's own customer – in this case DaimlerChrysler. There is no sense in warehousing the technical documentation. Nor is there sufficient time to perform the printing away from the production site, due to the just-in-time production needed.

So does this signify a renaissance of in-house printshops? Yes and no. In our example, the print media company providing the customer with the database publishing solution could also operate the digital press using its own printers, but on-site at the customer's rather than on its own premises. Service concepts of this type are known as "operator models".

Operator model

For every area of operation within a company, management decides on a case-by-case basis whether it will carry out the process step itself (in-house production) or whether it will buy in the product from a third party. In addition to these two "make or buy" alternatives, there is also a third option – namely to choose an operator model. In this scenario, the company gives a third party specialized in this area of operation the task of performing the process step on the company's own premises. The customer could therefore commission its print media service provider with the task of operating a digital press. The advantage from the customer's perspective is that he does not need to find trained staff from within his own ranks to operate the system in-house and does not need to make contingency plans for the event that the printer falls ill, for example.

1.5 Selecting, Installing and Using Content Management Systems

"Of course, we'd be more than happy to carry out subsequent updates of your website!" While a media service provider may be well intentioned in making this offer, it is scarcely likely to make the customer happy. Customers today want to have control over their own "assets" and "content" and have the means to update these themselves whenever they like. And that applies not just to the Internet, but also to the company's internal intranet, an area that is becoming increasingly important as a vehicle for communicating with employees and keeping them informed (keyword: "Knowledge management"). The media service provider should therefore make the most of this fact and offer to provide the customer with services for installing and maintaining suitable software that even non-experts can use to update the sites. Solutions of this kind are known as Content Management Systems (CMS).

Knowledge management

The term "knowledge management" describes all activities undertaken by a company to make the internal know-how of its personnel available at all times to all other employees within the company so that they can then use it in their own work. In the simplest of cases, knowledge management may simply consist of regular discussions in small companies. The bigger the company, the greater the amount of communication required to manage the internal knowledge. A CMS used to provide technical support in the intranet is an important element in achieving knowledge management in practice.

In its basic functions, in particular separating content and layout, the CMS is similar to the editorial systems used by publishers. To distinguish CMS from systems originally used solely to create print products, the term WCMS (Web Content Management Systems) is also used.

A CMS supports the following functions (among other things):

- Management of user and access rights: A central security concept can be used to define different user groups who are assigned specific access rights. For example, it is possible to specify who can change layouts, who can access the master pages and who has rights to enter content but not to delete it.

- Management of meta data: Meta data is all information relating to content which adds detail to the latter and makes it easier to find. In addition to management of authors' names, additional keywords and the archiving date, it is also possible to define when the document will automatically be deleted.
- Workflow management: Specific workflows can be defined and automated. For example, texts created for specific content areas can be submitted to the relevant superior for checking prior to publication. The superior can then choose to either approve the texts or return them to the author.
- Personalization: Extended statistics functions can measure reader behavior and the results can then be used to present the content in the way most appropriate for the target group.
- Multilingualism: The need to manage multiple languages on a website increases with the size and international positioning of the company.

From the customer's perspective, the main advantage of a CMS compared with Web editors such as Golive is the fact that they can be operated easily by different members of staff/departments.

Figure 14
Example of a website updated with a CMS system www.randomhouse.com

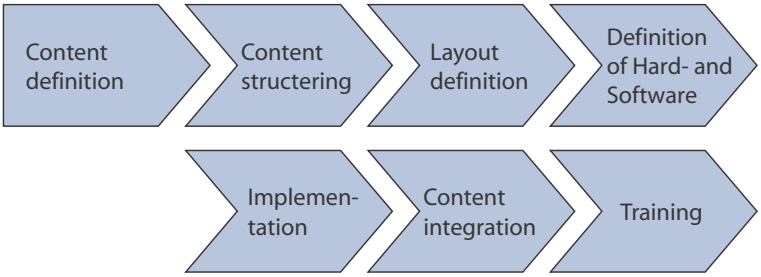


Figure 15
Possible services in the CMS environment

The market for Content Management Systems lacks transparency. It extends from simple – in some cases even free – open-source software to very complex systems that also incorporate e-commerce modules. The process of selecting and introducing a CMS that is suitable for media service provider customers can even develop into an area of operations in its own right.

Open-source software

A casual study of online work communities on the Internet reveals that there are literally thousands of programmers all over the world who are working on "open-source" applications. One of the key principles of these programs is that their source code is freely available on the Internet without charge.

This basic principle of unrestricted access means that these applications can be improved by anyone with programming skills, can be rewritten to suit their own particular needs, and can be used, copied, forwarded and posted back on the Internet in modified form.

The most popular open-source software products with users include the "Mozilla" browser, the "Linux" operating system, which is now also being used by government authorities, the MYSQL database, the "Apache" Web server and the PHP and Perl programming languages.

Open-source software should not be confused with freeware (free software), however. Freeware, as the name suggests, is also available free of charge. But the question of whether it can be changed, copied or passed on to others depends on the particular license conditions. Freeware still has an "owner", while open-source software merely has an "originator". The most famous originator of an open-source community is probably the Finn Linus Torvalds who placed the first Linux codes on the Internet.

1.6
Integration of E-commerce Systems

The process of setting up and managing Internet-based sales systems starts by simply providing a product description and integrating payments systems and extends to systems that can be used to highlight products, obtain personalized information from customer behavior, integrate partner shops and make direct inquiries about inventories. Figure 16 shows an overview of the key functions.

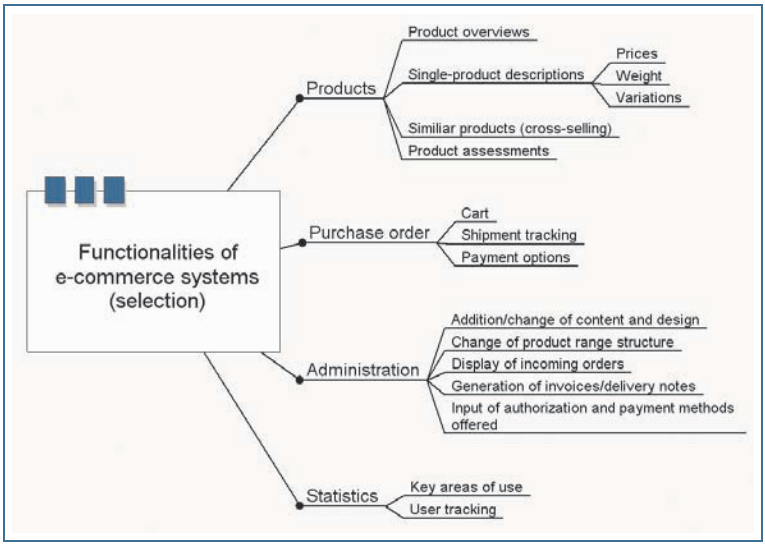


Figure 16
Overview of some of the functions of e-commerce systems

Developing a sales platform for major companies is more of a software engineering project than a design project. This is because the process of integrating the Internet platform into the customer's ERP systems can be highly complex – and efficient shipping processes can only be achieved through seamless integration of the e-commerce system into the customer's merchandise information system.

Some media service providers who are already experienced in creating product catalogs using databases have expanded their portfolios to include development and support of customers' e-commerce systems.

Figure 17
Example of the setting options supported by an e-commerce system
www.lynx.net.uk

Figure 18
Sample description of the "Setting up e-commerce systems" service
www.perfectblue.co.uk

1.7
Development of E-learning Applications

E-learning embraces all activities that are geared towards shifting the balance away from classroom learning in the form of seminars to Internet-based self-learning that does not tie students to particular locations or time slots. The content to be learnt, e. g. product training for sales staff, must be prepared so that the person studying the material is able to quickly identify the new material, can retain this new information and can also apply it in practice. This requires considerable design expertise, a fact that makes e-learning an interesting market for media service providers.

Experience of e-learning applications would suggest, however, that self-learning applications that are popular with students are the exception rather than the rule. This has resulted in the development of specialized e-learning service providers whose staff are able to combine knowledge of the relevant industry with knowledge of the educational concepts of Internet-based self-learning and the technical knowledge required for e-learning platforms. There has also been recognition of the fact that learning also embraces group learning, i. e. learning with each other and from each other. E-learning concepts therefore are combined with other forms of learning such as work in small groups, in-class seminars, video conferences and chat facilities. Experts refer to this as "blended learning".

In addition to the content to be learnt, e-learning applications also encompass numerous functionalities that facilitate learning with the tutor[2] and with fellow students. These include:

- Virtual classrooms where the people involved in the e-learning program can introduce themselves to others through their own small homepage, e-mail lists can be collated, or papers drafted by the individual students can be exchanged;
- Discussion forums, where questions and answers (from the tutor and fellow students) can be exchanged via e-mail lists and are documented for everyone to see, and
- Chat facilities which all the students and the tutor can use at a specific time for text-based exchange of information on specific issues.

[2] The term "tutor" is used in e-learning rather than "teacher" in order to emphasize his or her function as a learning support and not as a conveyor of knowledge – the knowledge itself should be conveyed by the e-learning content.

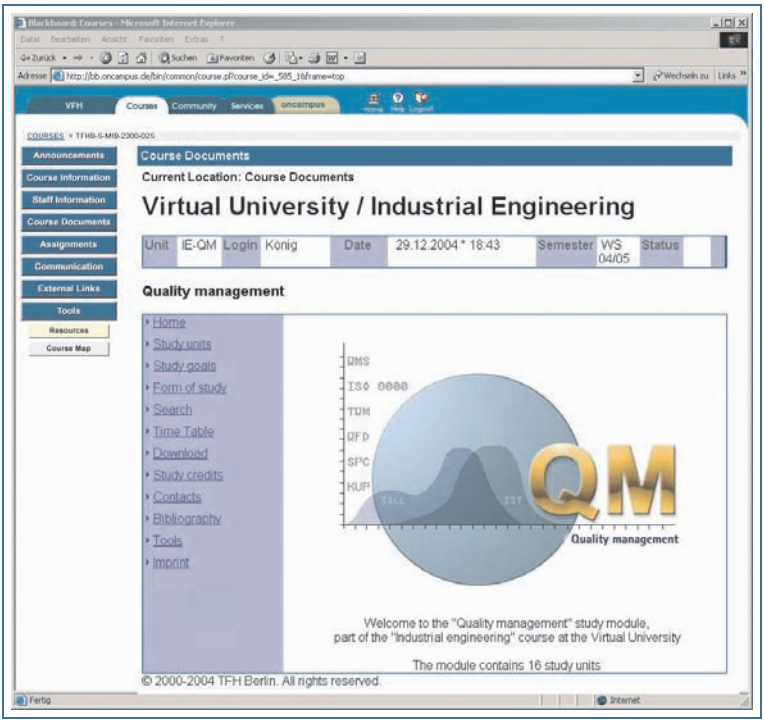


Figure 19
Sample page from a learning space system. In this case, Blackboard www.blackboard.com

An alternative term for e-learning is Web-based training (WBT), which has been borrowed from the older term computer-based training (CBT). CBT embraces all the learning software generally supplied on CD-ROM or DVD.

1.8 Supplying Quality Assurance as a Service

"You can always tell good quality by the fact that the customer comes back for more". This familiar saying from the business world is unfortunately no longer true when customers only use a service once and then prefer to use and update their website, e-commerce application or database publishing tool themselves. As a service provider, you might then have a reference product and a reference customer and your satisfied customer may even bring you additional customers through word-of-mouth recommendations, but you will always need to acquire new customers in order to sell your expertise again. And, as everyone knows, winning new customers is an expensive business.

Media service providers are therefore understandably on the lookout for business models that enable them to make ongoing sales to their customers. One obvious way of doing this is to take charge of the website content by offering Internet providing services. However, specialist companies on the market are able to provide this service far more cheaply.

A further option is to provide quality assurance services, though it is worthwhile noting that companies offering Internet providing services will often also provide quality assurance measures, in particular the technical measures referred to below.

The quality assurance (QA) aspects of an e-business application include technical and content-related elements. Central to the technical quality assurance system is the performance measurement aspect, in other words the ability of a computer linked to the Internet (Web server) and the software installed on this computer to process queries at an acceptable speed, even under peak loads. A second area of technical quality assurance involves automatic testing to check that the links to external websites (hyperlinks) are up-to-date.

The example of verifying that hyperlinks are up-to-date serves perfectly to illustrate the importance of both technical and content-related quality assurance. Software can only check whether a hyperlink (e. g. to an information supplier) is still in place. However, only a human can tell whether the content is still related to the subject in question or whether the relevant address is now being used for different content.

The content-related QA measures include:

- Usability tests: Testing an application's usability, i. e. the logical structure of the navigation, legibility, technical correctness of hyperlinks and their content, etc., is a matter that needs to be examined whenever a website is created. The media service provider has the necessary know-how. Because customers make constant changes and expansions to applications, using Content Management Systems and the like, usability must be systematically checked at regular intervals. A service provider is usually better suited than in-house personnel to do this work, since the latter can often not "see the wood for the trees".

User tracking: Usability tests also examine user behavior. This is done by analyzing the log files which document access to and use of the individual pages by customers (cf. Figure 20). It is particularly interesting with e-commerce applications to see how the customer has moved around the website, where he terminated his visit, how quickly he arrived at the product he was looking for, etc. To this end,

In order to investigate the negative conversion trend you need to examine the process of converting visitors to customers.

A comparative funnel report shows visits to each page in the shopping cart area of the site for this month in blue and last month in green. Looking down the funnel you can see if visitors made it to critical pages in the shopping process. Dropouts on the Ordering Information page were 7% higher this month than last. You are aware that changes were made to this page at the beginning of this month - could this be the problem?

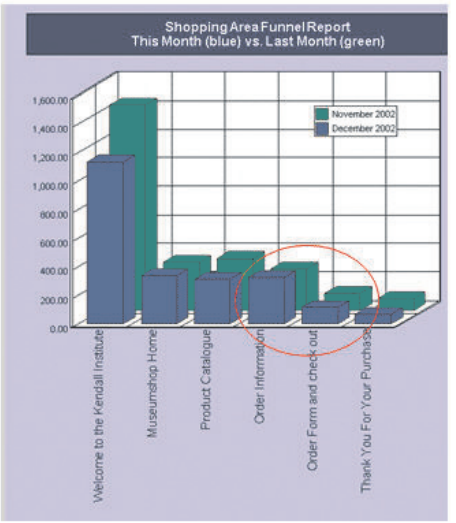


Figure 20
Example of an analysis of user behavior with NetTracker software
www.sane.com

behavioral variants need to be defined in the form of "click streams" which analyze the frequency of different behavioral patterns and use this information to develop improvements to the e-business application.

- Web-usage mining: This term encompasses more than just user tracking and takes in an analysis of the data resulting from a customer's e-business usage. The analysis attempts to use the vast quantity of data – which for data protection reasons is in anonymous form – to derive useful information about the (potential) customer. Essentially, it is a form of online market-research for pinpointing opportunities relating to specific customer groups (similar purchasing and information behavior), product groups (analysis of the contents of shopping carts) or cross-selling and for optimizing the website so that it is geared towards these target groups. Web-usage mining is thus one of the strategies of Customer Relationship Management (CRM).

Cross-selling

Cross-selling endeavors to sell buyers additional content-related products in addition to the original product or service. A tour organizer selling holdalls would be a good example of this.

Customer Relationship Management (CRM)

Customer Relationship Management is a strategic concept designed to systematically locate the customers that are important for the company in question and to provide appropriate marketing, sales and service offerings tailored to the various customer segments. One consequence of this strategy for the print media industry is greater personalization, versioning and customizing of media products.

2 Enhancing Process Efficiency by Integrating Customers in Production

The previous chapter focused on the opportunities that e-business offers to *boost sales* through new types of products and services. The following chapters will take a detailed look at the processes that can be changed by cross-company networking and the *cost savings* and *improved services* that these changes can yield. The following statement holds true for many printshops: "Our future doesn't lie in growth, but rather in intensifying our processes!" (Ulrich Thieme, Druckerei Thieme, Meissen).

Processes can be optimized (workflows improved) through a number of measures. These include drawing up standards, integrating quality assurance measures, improving employee skills and qualifications, selecting more appropriate materials, and so on.

When it comes to networked production, there are two key measures for optimizing processes:

- Workflow automation and
- the integration of upstream and downstream cross-company activities by customers and production partners.

The term *workflow* is used for automation of work sequences, while *e-business* is employed for the integration of cross-company activities. Both the technical and the business management workflows can be optimized in both cases.

In all instances, every endeavor is made to use data from preceding operations for downstream processes, thereby avoiding duplication of input. In other sectors of industry, this is also known as Computer-Integrated Manufacturing (CIM).

Computer-Integrated Manufacturing (CIM)

CIM covers all activities for transferring data from an upstream process to a downstream one and thereby achieve automation. In contrast to technical automation, it is not the machines that are interlinked, but rather the data flows. Standard data formats must be developed and employed to ensure that this functions smoothly across different manufacturers.

This chapter describes the possibilities that exist for process optimization by integrating cross-company activities with customers and production partners throughout the production process – from the initial quotation and placing of the order to the actual production and coordination processes right through to final delivery.

The overview in Figure 21 shows there are two basic concepts that we need to distinguish:

- self-service and
- co-production.

The basic concept of "self-service" embraces all activities that enable the customer or production partner to access data with as little involvement as possible by the print media company – just like

<table>
<tr><th>Concept \ Phase</th><th>Quotation</th><th>Order</th><th>Production</th><th>Shipment</th></tr>
<tr><td rowspan="5">Self-service</td><td>Online calculation</td><td>Online order generation</td><td>Online preflight</td><td>Storage management</td></tr>
<tr><td colspan="2"></td><td colspan="2">Order tracking</td></tr>
<tr><td colspan="2">Archiving of quotations and orders</td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2">Changing data and approving soft proof (Web printing)</td><td></td></tr>
<tr><td colspan="4">Online ordering systems</td></tr>
<tr><td rowspan="3">Co-production</td><td colspan="2"></td><td>Changes and approvals</td><td></td></tr>
<tr><td colspan="2"></td><td>Online editing</td><td></td></tr>
<tr><td colspan="2"></td><td>Remote proofing</td><td></td></tr>
</table>

Figure 21
Overview of e-business applications for customer-integrated production

self-service in a supermarket. The classical example is online price calculation. Section 2.2 contains examples of such applications.

The concept of "co-production" includes all activities geared towards building shared working platforms that customers and production partners can access in order to boost efficiency in production processes involving these different parties. Online editing systems are a classical example of this. Section 2.3 contains examples of such applications.

Sections 2.2 and 2.3 set out a number of e-business opportunities that are technically feasible today and a number of print media companies are already offering with various degrees of integration.

Before presenting and illustrating the individual applications in the following sections, let us first look briefly at the development of standard data formats – the basic requirement for cross-company cooperation.

2.1 Standard Data Formats – The Prerequisite for Networked Production

Standards have had a key role to play in industrial history. Indeed, the world economy today would be virtually inconceivable without them. However, the term "standard" is itself not standardized. Distinctions are made between

- Official standards such as those published by Deutsche Industrie Norm (DIN) or its umbrella organization, the International Organization for Standardization (ISO), which represents more than 140 national standardization bodies, and
- De-facto standards (also known as industry standards) which have been developed by leading industrial suppliers, e. g. the file formats in the Microsoft Office range.

For the print media industry, the de-facto standard PDF and official standards JDF and XML are vitally important in networked production. In addition, the data formats used by customers of the print media industry, such as the de-facto standard set by SAP and Microsoft, are growing in importance.

2.1.1
PDF/X-3 – The Technical Workflow Standard

All processes are becoming increasingly digital. In the *technical workflow* of the prepress stage, the customer provides the printshop with digital data and no further analog operations are required – apart from quality checks (form proof and color proof) – up to the film or plate imaging stage (Computer-to-Film, Computer-to-Plate) or the actual print (digital printing).

It is vital that the data formats in the transmission chain are standardized in order to ensure cross-company and device-independent networking in the prepress technical workflow. The PDF format has a major role to play in this regard.

Like PostScript®, the Portable Document Format (PDF) from Adobe® is a standardized output data format that can be created by virtually every prepress software package and interpreted by most output devices (printers, imagesetters). It is currently used by leading system suppliers for technical workflows (e. g. Prinect Printready System® from Heidelberg, Apogee® from Agfa).

The development of the PDF format has virtually nothing to do with the printing industry, however. It was originally developed to simplify the exchange of digital data within the office communication process by providing "digital copies". If a text is created in Microsoft Word, for example, and converted to PDF format before being transmitted in digital form, the recipient can read the document without having to have the original Microsoft Word program installed. The person creating the PDF format uses the Adobe Acrobat Distiller® for this process. The recipient of the digital copy can open the file using the free Adobe Acrobat Reader® now installed on virtually every computer.

The area of application for the PDF format has grown enormously and, as PDF expert Stefan Jaeggi writes from the perspective of the print media industry: "PDF can do too much". New possibilities for using PDF, such as digital signatures, correction notes in the form of "digital post-its" and various form options have made it necessary to further reduce the possibilities of the PDF format for the technical workflow in the print industry. This is where PDF/X-3 comes in.

The designation PDF/X-3 is a reference to ISO standard 15930-3 governing "Definition of digital print originals on the basis of PDF". A PDF/X-3 file is intended to contain all information required for high-quality output of a digital print original – and nothing more. PDF/X-3 thus restricts the functionality of PDF and makes the exchange format more reliable for prepress. Consequently, it does

not contain features such as notes, form fields or buttons on the page, does not include encryptions or other external references; the fonts are fully embedded and the images are in high resolution. A PDF/X-3 file is generated in a separate conversion operation in prepress programs such as XPress® or InDesign®.

Theoretically, customers, production partners and the print media company share a common language in the technical workflow – namely the PDF/X-3 format. Whether all partners actually do speak the same language depends on whether they buy the software version for generating and checking the PDF/X-3 file and whether they know how to use it correctly. The print media company has a key role to play in supporting this process.

2.1.2 JDF – On the Way to Becoming a Standard in Networked Production

Data for the business management workflow is generated even before the order is awarded and can include, for example, address information accompanying the customer's inquiry. Additional data is generated at the shipping and invoicing stages and when performing analyses for the controlling department. As with the technical workflow for the prepress stage, efforts are now being made in the business management workflow to harness information from upstream processes for use in downstream processes, to avoid duplication at the data capture stage, to facilitate automation, to reduce the number of process steps, and to draw conclusions from downstream processes that can be used to optimize upstream processes – and all of this on a cross-company basis.

Developments of this type are already very advanced in a number of industries. According to information from SAP, the HomeDepot chain of DIY stores in the USA handles 85% of all transactions with suppliers via e-business. This includes all processes from the initial order to actual billing. When goods are delivered to the store and approved, payment of the invoice to the supplier is initiated directly. This cross-company networking of customers and suppliers has been made possible by a de-facto standard – namely use of the same business management ERP system, in this case SAP.

Pilot projects are currently underway in the retail sector which are designed to link planning of production volumes for individual goods with records of sales figures at supermarket checkouts. Here, too, standard formats are essential to enable this networking in the first place. Initial figures are already available for the improvement

in process efficiency. Take the example of Burlington, the clothing manufacturer. By networking with its suppliers and dealers, Burlington was able to cut delivery times from 29 to 24 weeks and increase sales by 84%.

In the print media industry, there is so far no official or de-facto standard that would enable cross-company networking of business management data. This is due firstly to the large number of ERP system suppliers in the industry. But the situation is further aggravated by the fact that these software packets are rarely compatible with customers' software solutions in the industry.

The obvious solution therefore is to develop an official standard that will apply, at the very least, within the industry. This would allow business management data to be adopted from upstream and downstream production processes. Examples include:

- Formats specified in the quotation phase should also be used for setting the cutters and folders.
- The data generated when drawing up the imposition layout for costing purposes should also be employed by the digital imposition software.
- The precise printing time for actual runs and papers should be made available directly for evaluation by the controlling department.

It is now standard practice in networked production to link up the technical and business management data. This brings together two different software environments, however – the business management software used for managing quotes and orders (ERP systems) on the one hand and the technical workflow software on the other. Developments for networking these two software environments are being driven by the manufacturers of graphic arts hardware and software and by the suppliers of ERP systems tailored specifically to the needs of the print media industry through the advent of JDF (Job Definition Format).

JDF is an "open industry standard" for controlling production and organizational processes in the print media industry. Standards of this type are not static, since they need to reflect changing wants and needs and take into account new possibilities for exchanging data between components.

The history of JDF began in 1995, when fifteen manufacturers from the print media industry pooled resources to develop the PPF format (also known as the CIP3 standard). The outcome of this cooperation was that data from the imposition software of a whole range of manufacturers can now be processed for color presetting

	IFRA	PJTF	PPF	JDF
Agency		✓		✓
Prepress		✓	✓	✓
Press		✓	✓	✓
Finishing			✓	✓
Messages	✓			✓
Status inquiries	✓			✓
ERP systems	✓	✓	✓	✓

Table 1
Integration of multiple standards into the JDF format

of presses without the need for an intermediate plate scanner. In 2000, at the initiative of Heidelberg, one of the founding members, Adobe, Agfa, Heidelberg and MAN Roland began integrating the PPF format, the PJTF format from Adobe and the IFRAtrack format into the JDF format. Table ° 1 shows the functionalities of the individual standards.

The body coordinating the manufacturers is the CIP4 consortium (International Cooperation for the Integration of Processes in Prepress, Press and Postpress), which represents over 100 software and hardware suppliers in the print media industry under the auspices of the Fraunhofer-Institut für Graphische Datenverarbeitung (IGD, Fraunhofer Institute for Computer Graphics) in Darmstadt.

JDF applications today are still focused primarily on internal networking of printshops. Because JDF is defined using the XML standard popular in industry, it is also suitable for cross-company networking.

2.1.3 XML – The Standard in E-business

XML (E**X**tensible **M**arkup **L**anguage) was developed as an official standard by W3C (World Wide Web Consortium) for exchanging data between companies using the Internet. Like HTML, it is a markup language. While HTML's strengths lie in its easily learnt language set for creating static websites, XML's logical structure and greater scope makes it ideal for automatic interpretation of metadata by other programs (e. g. product group, price or stock levels) and thus enables automatic data exchange with like-structured data. The following example illustrates the difference between the two markup languages.

- **HTML**
  Marie Curie
  7 November 1867

- **XML**

  <firstName>Marie</firstName>
  <lastName>Curie</lastName>
  <dateBirth>11-07-1867</dateBirth>

XML has now become so popular internationally in the e-business sector that it is now an accepted standard.

2.2 Process Efficiency Through Self-service The Self-directed Customer

E-business has already brought about a lasting change in customer behavior. Just how extensive this change has been is something you have probably experienced for yourself with online banking, for example. Like me, you probably think back with horror to the times when you didn't even know what standing orders you had set up and remember the effort involved in getting an amount changed. You can now do this yourself from home without having to contact a bank clerk – something that I personally do not miss. This process is irreversible in my opinion. So much so that when my online bank was taken over by a conventional branch-office bank who then tried to build personal contact with me, I made every effort to avoid this. I suppose that, as far as banking is concerned at least, I'm a classical *self-directed customer*, the type of customer who is prepared to take the time to learn what needs to be done so that I can manage my own affairs as far as possible.

The bank's core business of offering financial services has not been affected by online banking, but the processes involved and the benefits to both sides have seen significant change. The customer has less to do and gets greater benefits. This in turn enables the supplier to streamline his internal organizational processes since the customer does all the work for him.

If we apply this to the print media industry, there are several ways in which the customer can perform the organizational work of the printshop himself.

- online calculation
- submitting an order
- verifying the data dispatched with regard to its technical feasibility (online preflight)
- modifying data in standard printed matter (Web printing)

- monitoring orders (order tracking systems)
- accessing old quotes and order data
- accessing inventory data, and
- integrated online order systems that can even include customer-specific corporate design portals.

Studies conducted by the IRD (Institut für rationale Unternehmensführung in der Druckindustrie e.V.) illustrate the impact that systems of this type have on process efficiency. These reveal that an average member of the in-house sales team works around 46.3 hours per week if we exclude e-business. This time is spent of three main activities – providing assistance and advice to external customers (cf. Figure 22, shown in gray), internal quotation and bidding processes (blue) and internal order-related processes (red).

If we take a closer look at the individual tasks and check the potential they offer for cutting costs, the IRD concludes that the tasks "costing and drawing up quotations", "costing and confirming orders" and "providing support during production" (e. g. dealing with customer queries about the order status) can yield time savings of up to 50% (cf. Table 2). The time saved, according to the IRD, is 11 hours per week. This equates to almost 25% of total working time.

	Actual	Potential saving
Assisting external customers/quotations/orders, contacts	1.8	
Discussing quotations, taking over quotations from field staff	1.9	1
Clarifying aspects of quotations with customers, providing advice and assistance	4.0	
Costing and drawing up quotations	10.9	5.5
Follow-up work	1.5	
Discussing orders, taking over orders from field staff	1.7	
Costing and confirming orders	5.7	3
Drawing up working documents, transfer to technical department	7.6	
Providing support during implementation	5.6	1.5
Actual costing, invoicing	2.7	
Processing complaints and queries, ancillary servicesy	2.8	
Total	46.2	11

Table 2
Potential savings in hours per week achievable by in-house sales staff thanks to e-business applications, according to IRD study 2003

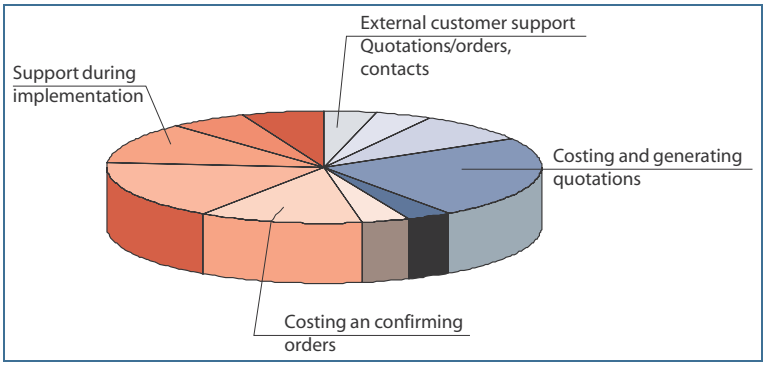


Figure 22
Activities of inhouse sales staff.
IRD study 2003

2.2.1 Online Calculation – No Sales Team Can Match the Speed of the Customer

Online calculation facilities provided by a number of print media service providers enable customers to gain at least a rough idea of the costs involved themselves. The benefit to the customer is obvious, since he can get the information he requires straight away, 24×7. Despite this fact, many printshops are cautious about making this move. Their arguments are equally obvious. The greater transparency also results in greater competition – and the printshop has no means of adjusting the price that the customer is quoted. This means that there is no way of communicating any cheaper production options to the online customer, since the supplier is not aware that he is actually online.

Most online calculation modules used by printshops today can only be accessed by registered customers, thereby preventing competitors from gaining an insight into pricing structures. These modules also make it possible to store customer-specific prices and thereby encourage customer loyalty.

From a technical perspective, most solutions are developed specifically for this purpose. The first industry-specific ERP systems enable registered customers to access the calculation module online.

Figure 23 shows an extract from the online-pricing module of full service provider Desktop Digital Printing in Houston, Texas. The service can be accessed following login.

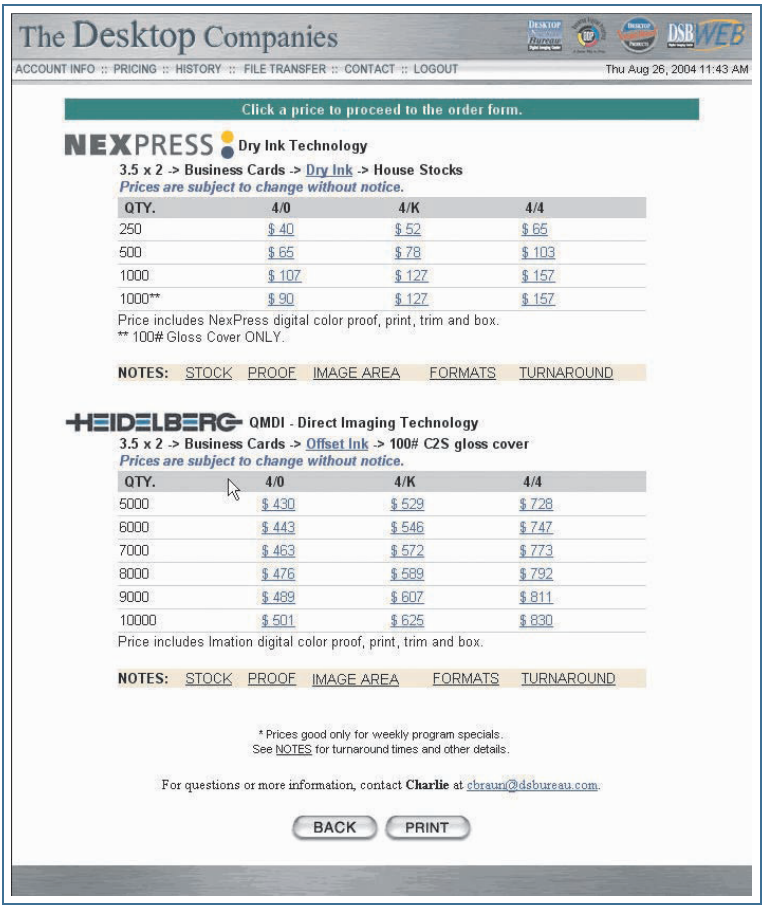


Figure 23
Example showing the result of an online price inquiry at www.dsbureau.com

2.2.2 Online Order Placement

Putting a structured procedure in place to enable customers to place orders online greatly facilitates the subsequent production process. Figure 24 shows an online order form used by the British print company Sumfield & Day. Tools such as this are of great benefit when the online inquiry is linked to commercial industry software. Data entered into this form does not need to be re-entered and can be incorporated directly into the calculation process.

The printshop can also use the form to send the print data to the customer in PDF format. This file uploading process can be combined with an online preflight check.

Figure 24
Example of a structured online order form www.sumfieldandday.com

2.2.3
Online Preflight Checks

The term "preflight check" describes the use of software programs to verify that incoming data is complete and suitable for the rest of the technical workflow. The programs are generally passive, in other words they carry out checks and report problems such as missing embedded fonts, but do not correct these problems automatically. Further developments to the programs also enable active "repairs" to be carried out on PostScript or PDF files, e. g. reinforcing hairlines.

The term "preflight check" has been borrowed from the aviation industry. Before the flight, pilots use a structured check list to verify that the relevant systems exhibit "zero-defects quality"[3].

[3]The term "zero-defects quality" is borrowed in turn from quality management. The objective of zero-defects quality is that everyone involved in the process at the interfaces to the next stage of production be made responsible for the quality of the supplied intermediate products and their ongoing improvement until zero-defects quality is achieved.

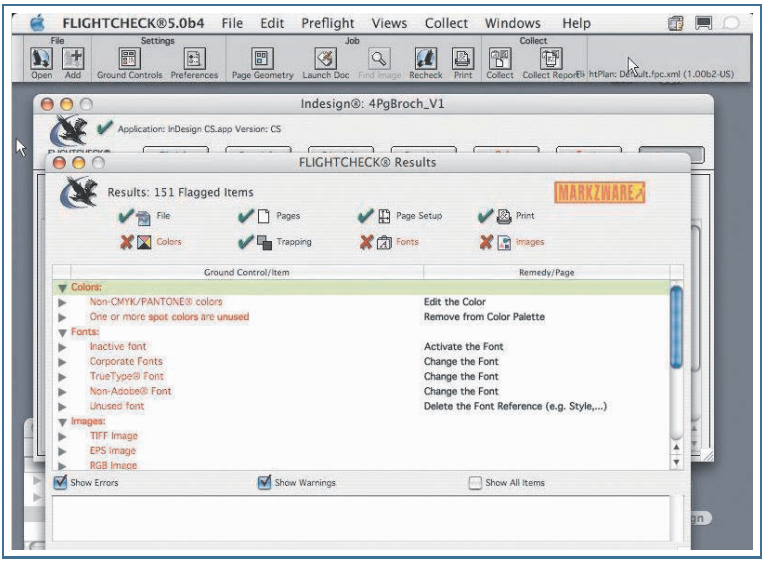


Figure 25
Example of the result of a preflight check
www.markzware.com

A frequent point of debate is the extent to which, to ensure production runs smoothly, the printshop should carry out a preflight check on incoming data and the extent to which the supplier – i. e. the customer or agency – should carry out a preflight check when dispatching data. Everyone agrees that the latter option would greatly enhance the reliability of the production process, but it would need to be carried out correctly. In other words, even if the customer carries out a preflight check, it is still wise to repeat the check at the printshop (cf. Figure 26).

With an "online preflight check" the supplier carries out the preflight check online using the software installed at the printshop. The supplier – who in most cases will be the customer – therefore does not need to buy and manage the software himself. Instead, the printshop provides this is an online service.

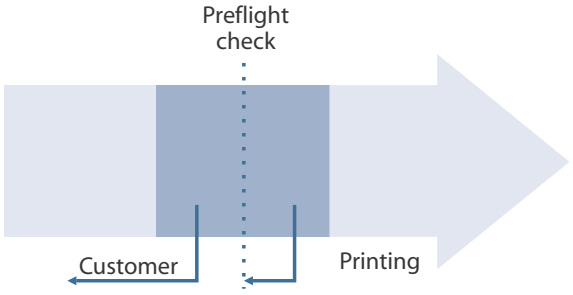


Figure 26
Quality control in the technical workflow at the interface to the customer

2.2.4
Modifying Data and Approving Soft Proofs – The Key Principle of Web Printing

When orders are submitted online with the data to be printed being uploaded and preflighting possibly already performed online to verify print quality, the printshop will assume that the file created by the customer is ready to print.

But even when the customer wants to use design services as well, he can still benefit from "self-service" by using "Web printing".

When using Web printing, the customer simply enters his data (texts or images) in structured form in layout templates. Once he is ready, he can see a preview in PDF form created using the print media company's layout software.

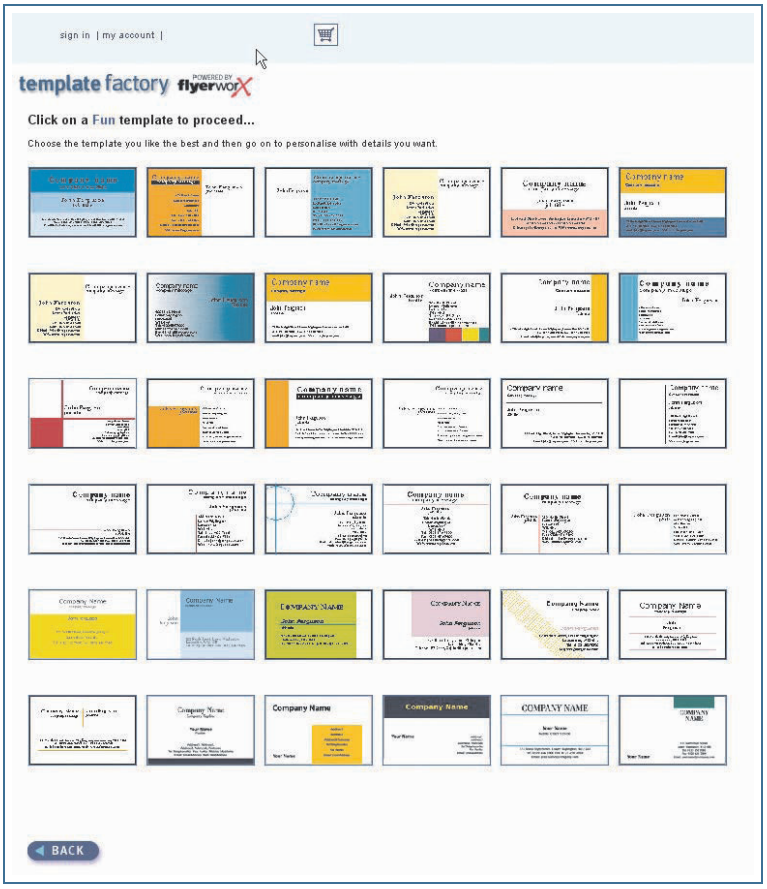


Figure 27
Selecting predefined business card templates on the Web
www.printing.com

The British franchise company "Printing.com" with its central printing location in Manchester provides both private and business customers with an Internet-based development process for printed matter (cf. Figure 27).

The customer can use defined templates with a range of options to create and verify a customized print object before approving it for print. Anyone who is familiar with the long processes involved in advising on the design of wedding announcements from a printer's book of templates can well imagine the extent to which process costs can be cut if the customer is able to perform this work himself on the Internet.

More lucrative than orders from private customers is the possibility of enabling corporate customers to save their printed matter in the correct corporate design using a password-protected Web printing portal. Figure 28 shows such a process from the customer's perspective. On the right, the data is entered in structured form. It appears on the left as a preview PDF file which can be verified and approved for printing.

Web printing is an application which, when viewed in isolation, appears to apply to only a few peripheral areas from among the great diversity of publications that the customer can customize himself. This is true, but Web printing offers very considerable potential when integrated with other customer self-service functions

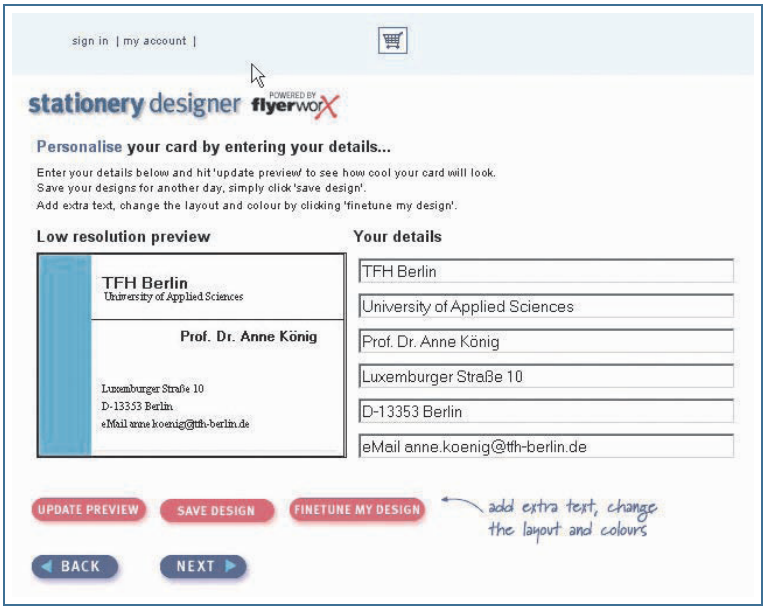


Figure 28
Structured data input and preview for approving a business card
www.webprint.de

such those offered by online ordering systems and the like. This is described in Section 2.2.8.4 using the example of the Adam Opel AG corporate design portal. The key to success is customization.

2.2.5 Order Tracking by the Customer

Order tracking involves electronically monitoring the status of an order as it proceeds through specific interfaces on its way from reception through to final delivery. In networked production scenarios, the Internet can be used to extend the order tracking function not just to in-house personnel, but also to customers and production partners.

Order tracking systems that can also be used by customers have become particularly popular, particularly in courier services such as UPS. The packages are scanned at various transfer points along the delivery route and feedback is provided electronically. Using a website or automated voice-operated telephone service, the customer can then quote his reference or order number to determine where his consignment is at any particular time.

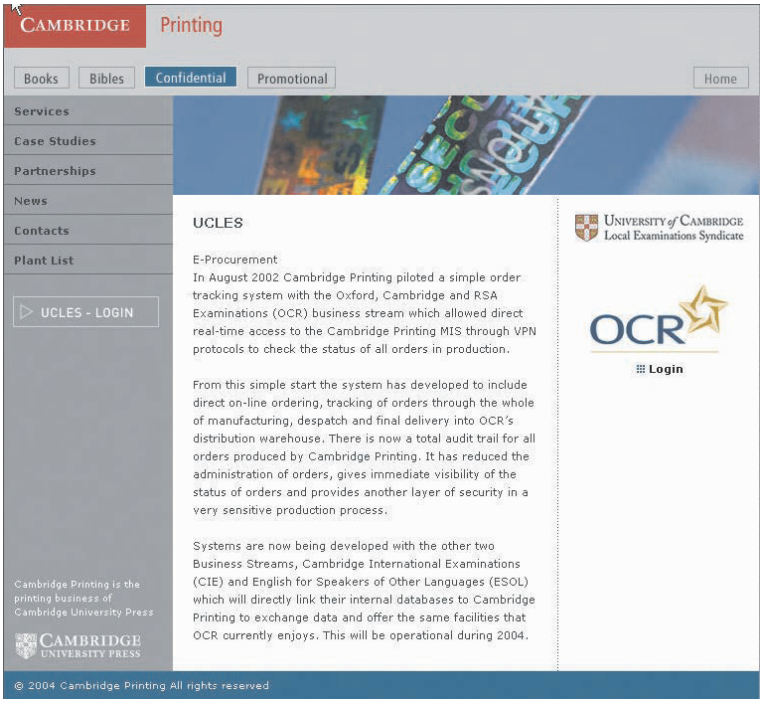


Figure 29
Example of the benefits of online tracking
www.cambridgeprinting.org

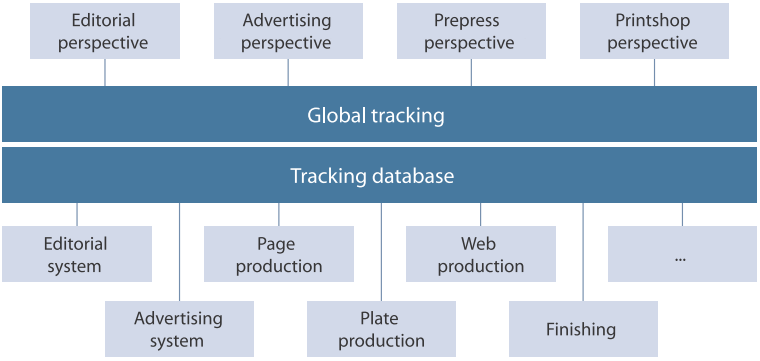


Figure 30
Open interfaces of the various software systems in a newspaper production process for in-house order tracking, using the example of IFRA-Track

In sheetfed offset, PPS software and order tracking systems have not yet caught on. The situation is different in newspaper printing. Back in 1996, the international association IFRA began defining a standard format that would enable status feedback of this type across different manufacturers (cf. Figure 30).

In-house electronic order tracking facilitates the internal production planning and control process. Flexibility is also enhanced. For example, which forms can be changed without additional effort? Which orders can be brought forward if there are delays to the planned print job, etc.

Making order tracking available to the customer reduces the amount of communication required, since the customer is able to check the status of his order himself. He no longer has to call the supplier. He simply checks on progress by accessing the system with a password.

However, the fact that the customer can monitor things himself is also the main disadvantage of this system. Order tracking gives the customer a direct insight into your operations – something that may not necessarily be welcomed by every printshop manager.

Currently, systems of this type offer cost-cutting potential in a number of key areas where

- a high degree of standardization means that the customer is able to "manage" his orders himself – this therefore applies in particular to digital printing, and where
- a highly complex production process involving a large number of players requires close cooperation with the customer.

In future, order tracking systems for commercial printing will be made available as part of integrated concepts. For example, the iWay online ordering system of Heidelberger Druckmaschinen AG and

various nascent business management systems support Web-based order tracking by the customer.

2.2.6 Quotation and Order Archiving

Printshops can make the customer's job easier by giving him access to old quotation and order data, possibly linking this to the old digital file actually used for printing. This is exactly what Adare Halcyon, an old-established printshop in Huddersfield, England, has done for its customers. After the customer has gained access to the system by entering a password (cf. Figure 31), he can view all his orders in the archive (cf. Figure 32). Various search options (current or archived orders in overview form, searches based on customer order number, in-house order number or the customer's article number) make access easier. Figure 33 shows what an order looks like in detail. Figure 34 shows the order list.

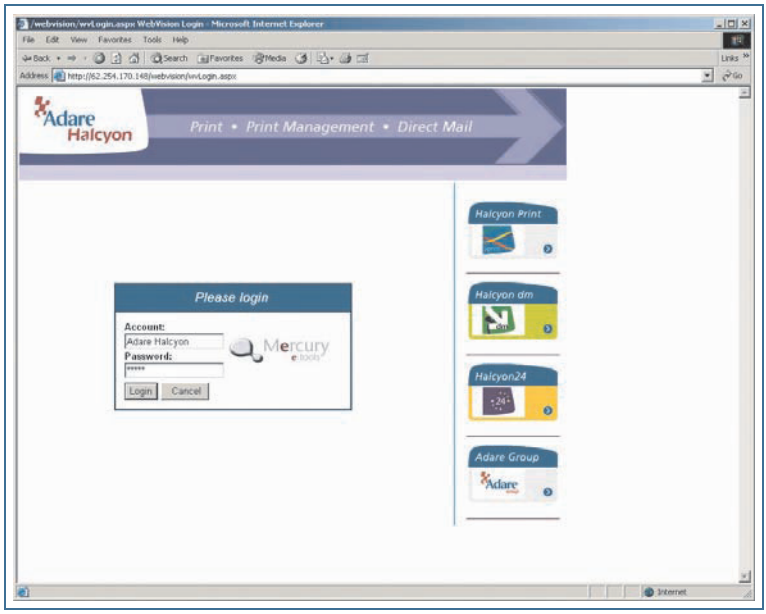


Figure 31
Homepage of Adare Halcyon, Huddersfield, England www.adarehalcyon.com

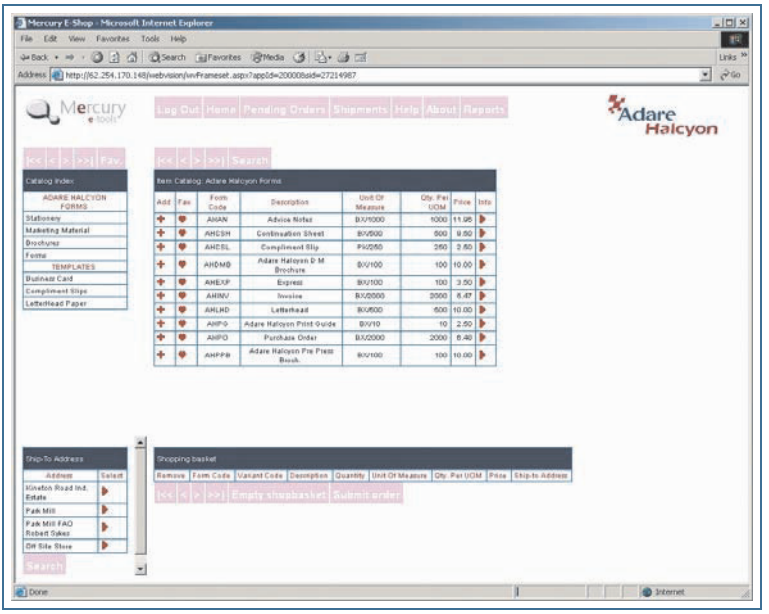


Figure 32
Overview list of customer orders www.adarehalcyon.com

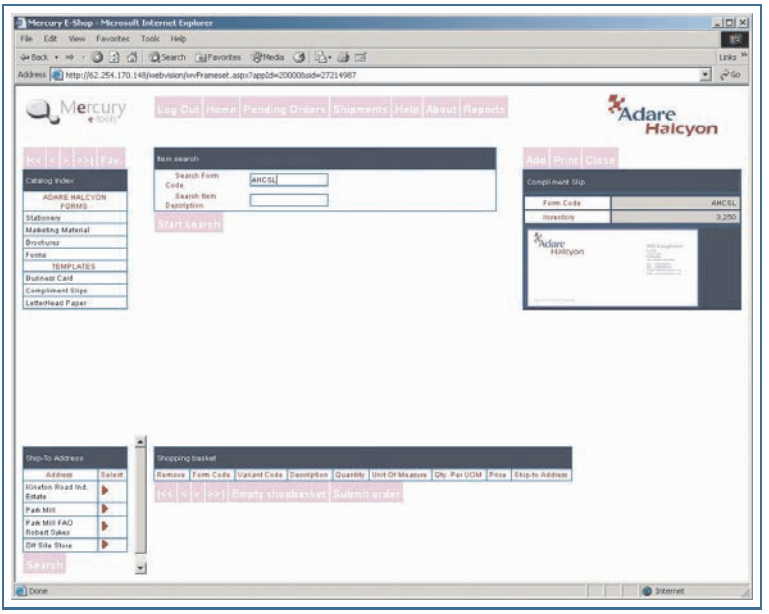


Figure 33
Detailed view of an archived order www.adarehalcyon.com

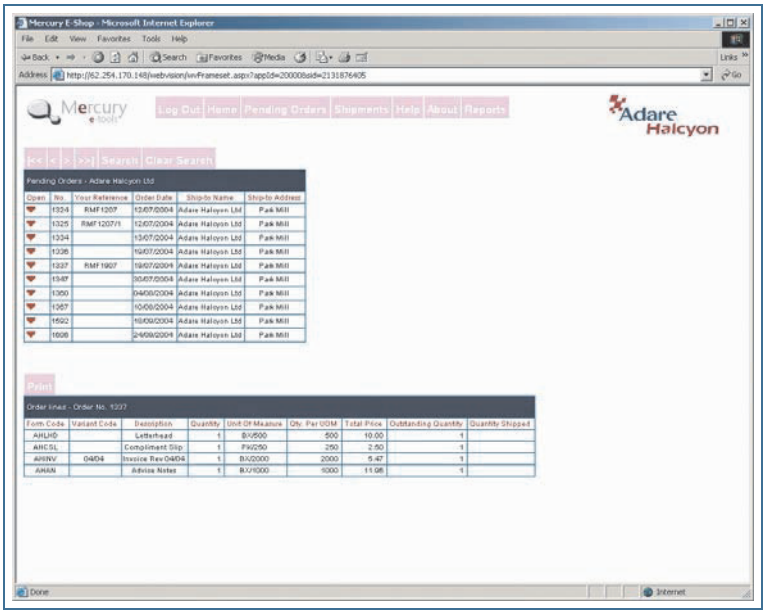


Figure 34
Order list www.adarehalcyon.com

2.2.7
Warehouse Requisitioning Systems

When a print media company stores a customer's printed matter, it can offer the customer direct warehouse management with requisitioning facilities. Industry software supplier Printplus of Switzerland has provided precisely these facilities to the Druckerei Schmidt-Fehr AG printshop in Goldach (Switzerland) to expand its quotation and order archiving service.

The project was implemented jointly with a major customer who was keen to optimize its own purchase order workflows. One of the key aims of the project was to provide everyone involved with rapid information about deadlines, order quantities, deliveries, stock levels and billing.

Customers can now obtain information about current stock levels directly via a website and can track the movement of articles online. This ensures that buyers are also kept informed about purchase orders placed by branches. Follow-up orders also arrive at the printshop electronically. "Both we and our customers save time and money", states Managing Director Matthias Schmid. The service is now offered to all customers along with the facility to access quotations, orders, delivery notes and invoices.

2.2.8
Online Ordering Systems

Online ordering systems bring together various self-service functions that enable the customer to perform as many operations as possible before, during and after orders are placed.

As Figure 35 shows, online ordering systems fall into three different categories:

- Software developed in-house for this purpose which is available in the form of special applications, but also as complex, customizable solutions that can be integrated into customer systems;
- Add-on modules for print industry-specific, business management software and
- Business management software modules used by print media company customers (e. g. ERP software).

All the systems on the market are undergoing constant development. It is therefore only possible to provide a snapshot of the various functionalities currently available.

The first technical implementations of online ordering systems were in-house developments focused on specific applications, for example providing standard printed matter with Web printing capabilities, awarding orders to copy shops or digital printshops, or arranging and commissioning mailing campaigns online. In future,

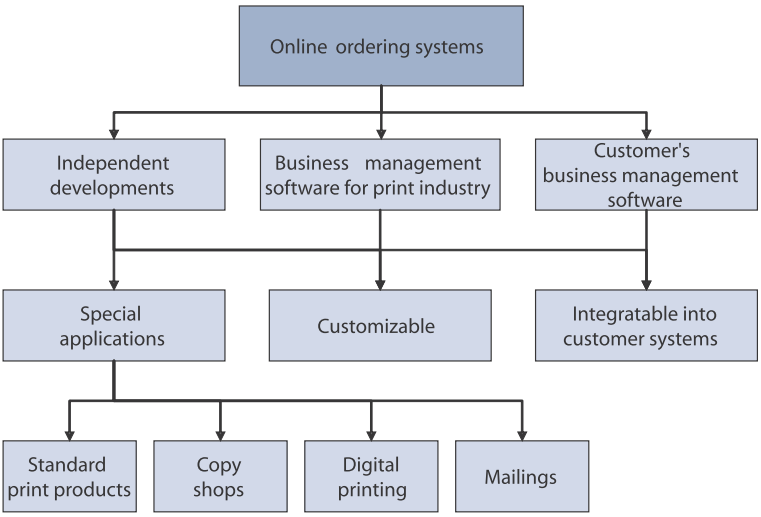


Figure 35
Overview of online ordering systems

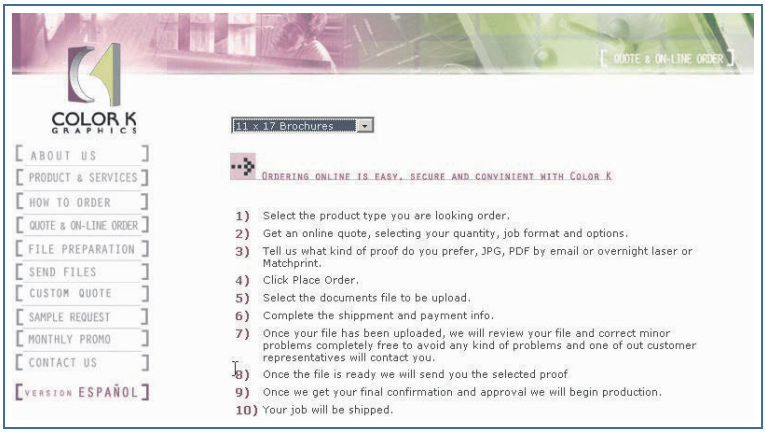


Figure 36
Description of the ordering process www.colorkgraphics.com

too, it will be necessary to resort to software developed specifically for particular business ideas. However, it will become increasingly necessary in networked production to integrate the specialist applications into the print media company's business management systems and/or the customer's systems.

2.2.8.1 Special Applications for Standard Printed Matter Example: ColorK Graphics, Florida

The online ordering system operated by offset and digital printers ColorKGraphics in Miami, USA systematically guides the customer through the various input fields, providing him with visual support in the process. He selects the format, colors, type of binding, run and payment mode. His order is then calculated and he can upload the file to the company's server.

2.2.8.2 Customized Online Ordering System, Illustrated Using the Example of PSH iWay Prime – Integration Right up to the Printing Press

While the aforementioned specialist applications for copy shops do not handle customer-specific data, other software products do support customization.

PSH iWay Prime is an excellent example of such a system and is described below. There are two key goals with the software:

- Reducing process costs for the customer and the printer by incorporating a high level of *self-directed customer* functionality.

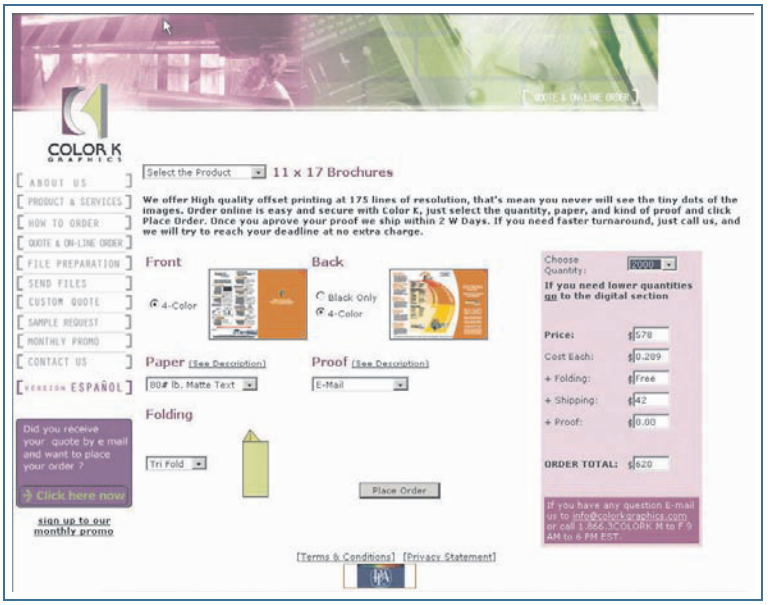


Figure 37
Example of an online ordering process www.colorkgraphics.com

The customer can manage and place his print orders himself, while also monitoring their status. Each customer therefore gets his "own" personal online ordering system. The system can also be integrated with the customer's ERP software, e. g. SAP.

- Reducing the printer's process costs by also integrating the technical workflow. The customer's order can be automatically imposed and entered into the queue for the digital press.

After logging into the system, the customer is able to

- Configure and manage reprints (both with and without changes) of all print orders that he has placed or intends to place with the printshop and, where applicable, order these from the printshop (cf. Figure 38)
- Modify texts (Web-to-print functionality)
- Create new publications (cf. Figure 39)
- Change print parameters, e. g. color, print run, paper grade or format
- Specify the delivery date and delivery address (cf. Figure 40)
- Calculate prices by online calculation or by consulting tables (cf. Figure 41)

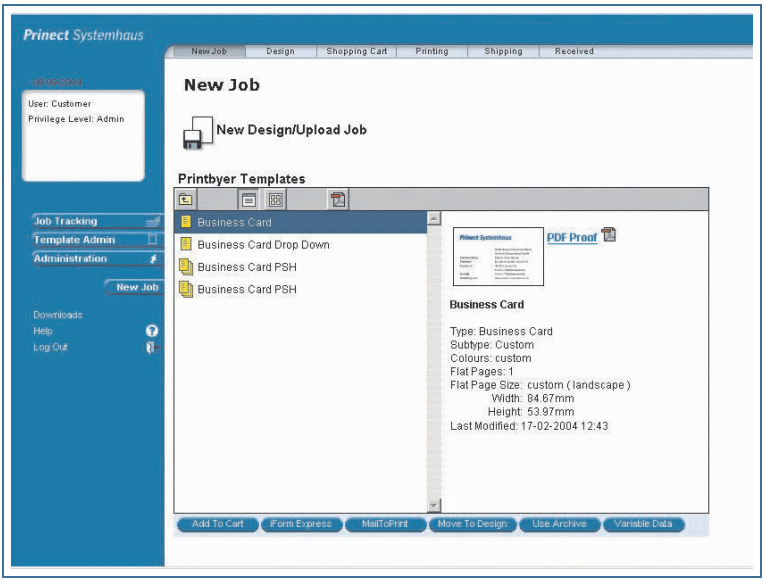


Figure 38
Customer's view of the orders he has already saved in the system. Example: PSH iWay Prime

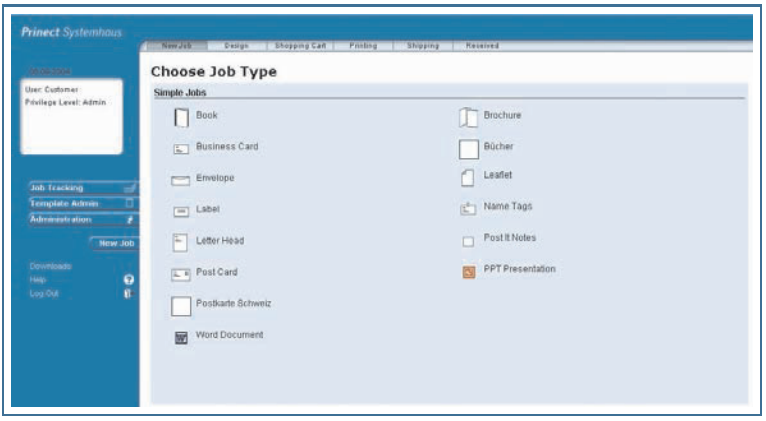


Figure 39
Setting up a new order. In this case, the Selection menu. Example: PSH iWay Prime

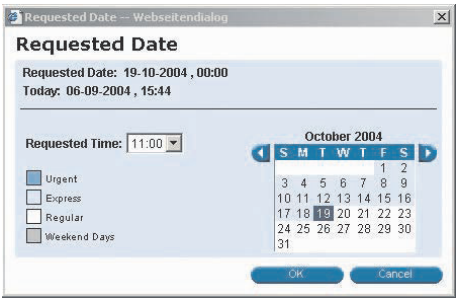


Figure 40
Specifying the delivery date. PSH iWay Prime

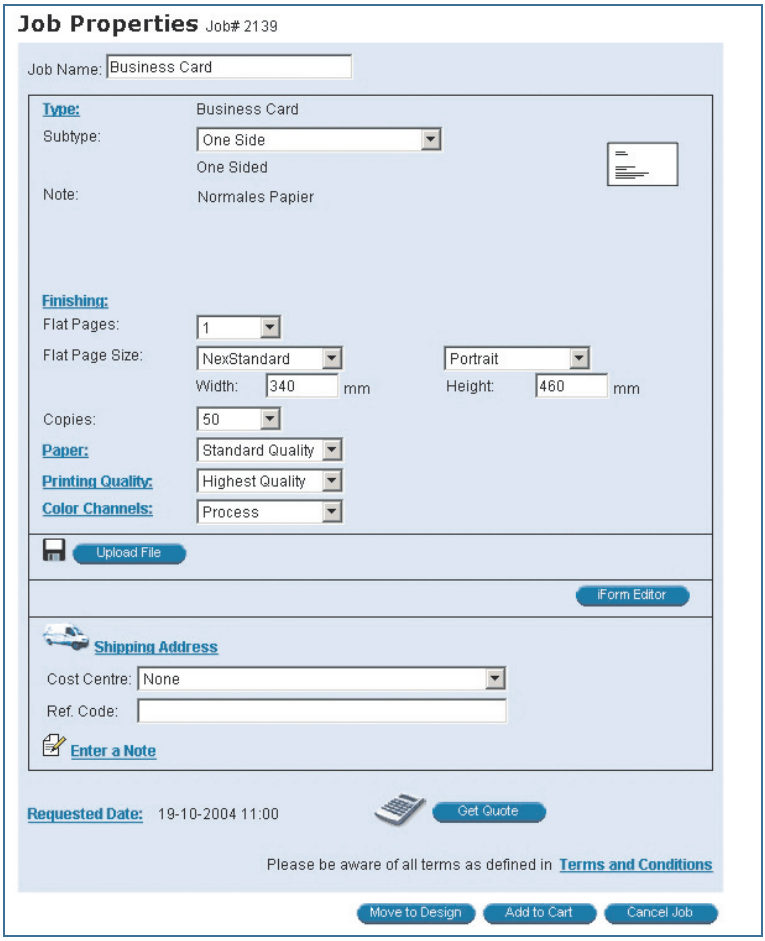


Figure 41
Setting up and performing cost calculations for a new order using the example of a brochure PSH iWay Prime

- Place the order (cf. Figure 42)
- Give the required approvals (cf. Figure 43)
- Track the order status

This then is the situation from the customer's perspective. From the perspective of the print media company, an online ordering system of this type can facilitate the task of managing a large number of orders. This requires a link to the business management software on the one hand and to a digital printing press on the other.

Figure 44 shows the iWay Prime networking concept, which takes the production process right up to the digital press. The customer edits a template on the iWay server online. The software

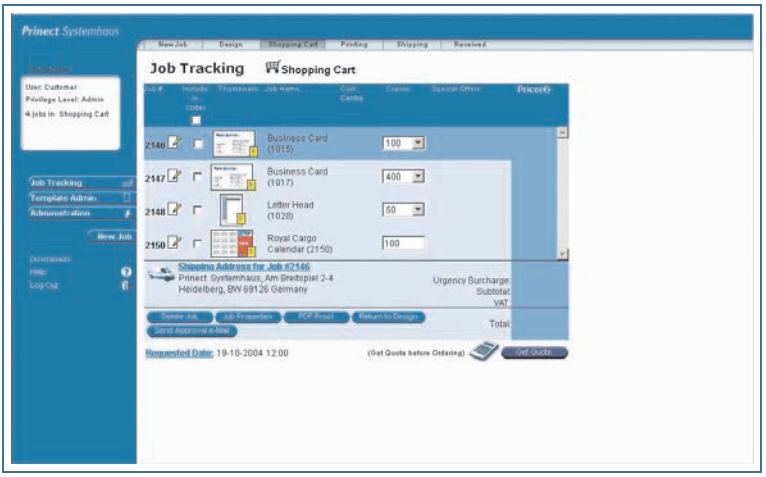


Figure 42
Placing orders using the PSH iWay Prime shopping cart function

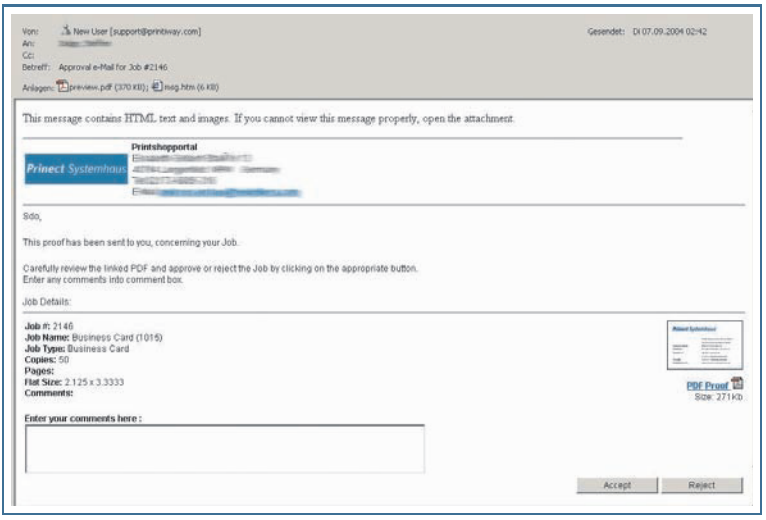


Figure 43
Approval function PSH iWay Prime

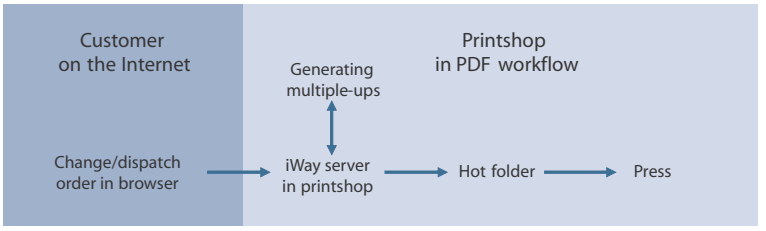


Figure 44
Networking concept with iWay up to the press

then uses this to generate a multiple-up in PDF format. The PDF file is stored in the hot folder and is thus routed automatically to the press.

2.2.8.3
Customized Online Ordering System Using the Example of PrintVis – Integration into Business Management Systems

Companies supplying business management software to the print media industry have already added customizable online ordering modules to their systems or are currently doing so. Many of these suppliers are also involved in the further development of the JDF format that will enable them to integrate their software into the technical workflow. What's more, the first software interfaces are also providing a vehicle for integrating individual customer ERP systems.

Incorporating online ordering systems as modules in the business management software has the advantage that the software automatically creates an order at the precise moment when the customer submits his order online. The sales staff are notified by e-mail and/or text message that an order has been received. Since the customer has entered the data directly into the print media company's business management software, the data does not have to be captured again for any other commercial processes.

The e-business functions available to the customer can include all the possibilities set out in Figure 21.

Figure 45 shows the user interface of the "PrintVis" online ordering system. This business management software for print media companies was developed by the Danish company Novavision and is based on the Microsoft Navision ERP software used by numerous SMBs. This facilitates integration into customer systems that are also based on Navision.

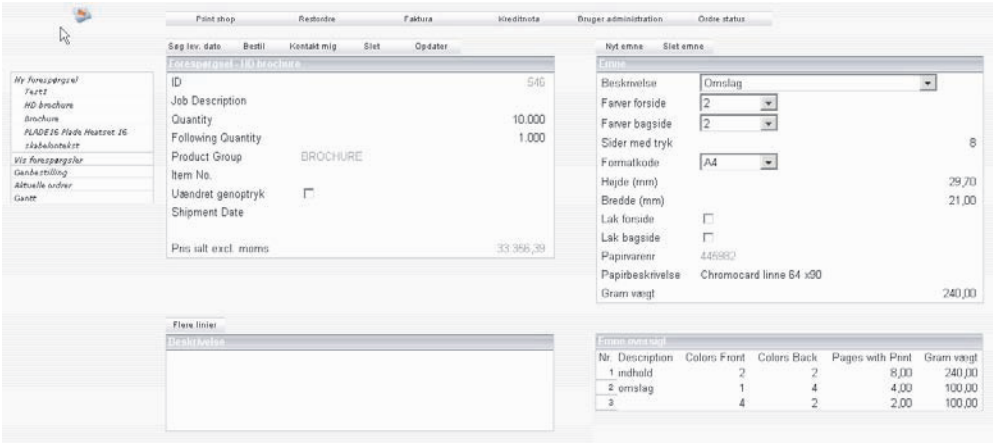


Figure 45
User interface of an online ordering system integrated into the business management software www.novasoft.dk

2.2.8.4
Corporate Design Portal Using the Example of Adam Opel AG

The online ordering systems discussed in the previous chapters can significantly improve the process efficiency of customer and printshop alike. The fundamental principles of online ordering systems provide an excellent basis for extending the networking process much further for key accounts with very specific needs and requirements. To this end, however, very incisive measures must be adopted in the customer's organizational structures for purchasing printed matter. Such systems are therefore generally implemented as IT projects by a software house.

Customized online ordering systems are also known as "corporate design portals" or "advertising material ordering systems". From the customer's perspective, these applications have three objectives:

- Implementing the corporate design guidelines for all printed matter and digital media ("advertising material") throughout the organization.
- Reducing process costs in every area of the procurement process – from inquiries for quotations to price comparisons, purchase orders and stock requisitions.
- Reducing production costs by bundling together print jobs.

The online ordering system of Opel AG, to which all 1,800 Opel partner businesses are linked, is an excellent example of this. Development of the system began in 2001. Even at this early date, all Opel approved dealers were networked via an intranet, the OPN – Opel Partner Net.

Figure 46 shows the current networking concept. The individual approved dealers can log onto the system via the intranet and access their own customized templates. They can create and archive new printed matter from a comprehensive template database using the Web printing function. The media database includes photographs that they can use to customize advertisements or sales brochures.

The aim of the IPAC – Interactive Print Advertising Center – online ordering system project was to give the dealers the means to customize, manage and order templates complying with the design guidelines. Prior to the advent of the IPAC, dealers would frequently create advertisements for local newspapers and the like by cutting and pasting ads together themselves, often using an old Opel logo. This state of affairs naturally provoked horror among Opel advertising strategists. Another benefit of this networking concept

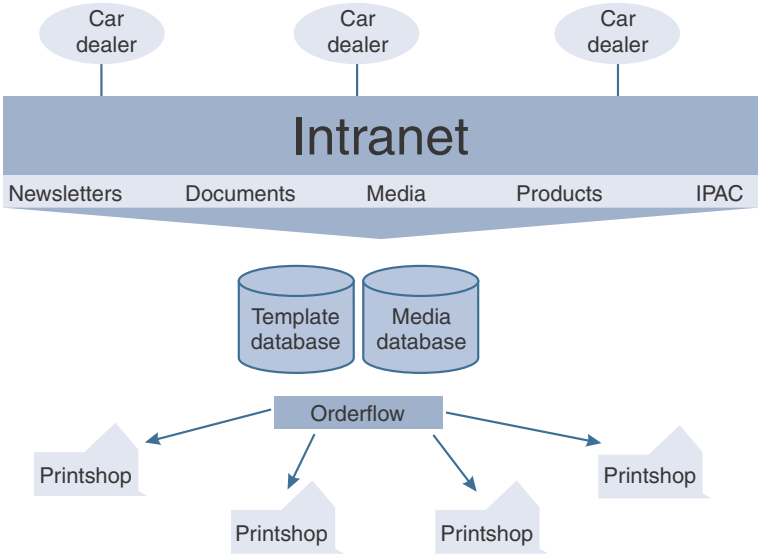


Figure 46
Networking concept of the IPAC online ordering system of Adam Opel AG

was that printing costs could be reduced by bundling together the various orders. The message "The closing date for orders to be produced in calendar week 45 is Monday, 8 p. m." appearing on the homepage of Opel approved dealer Autohaus Thüllen in Aachen, Germany (shown in Figure 47) provides a pointer as to how orders are bundled together.

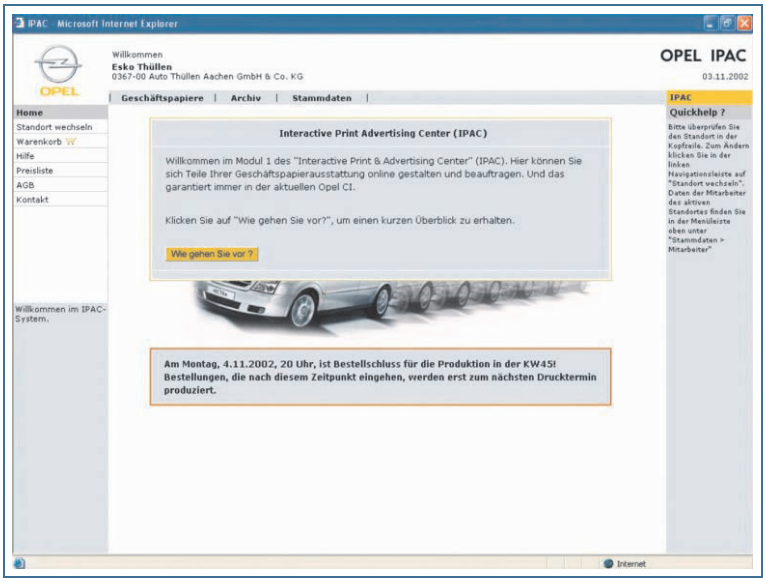


Figure 47
Homepage of an approved dealer – in this case Autohaus Thüllen of Aachen

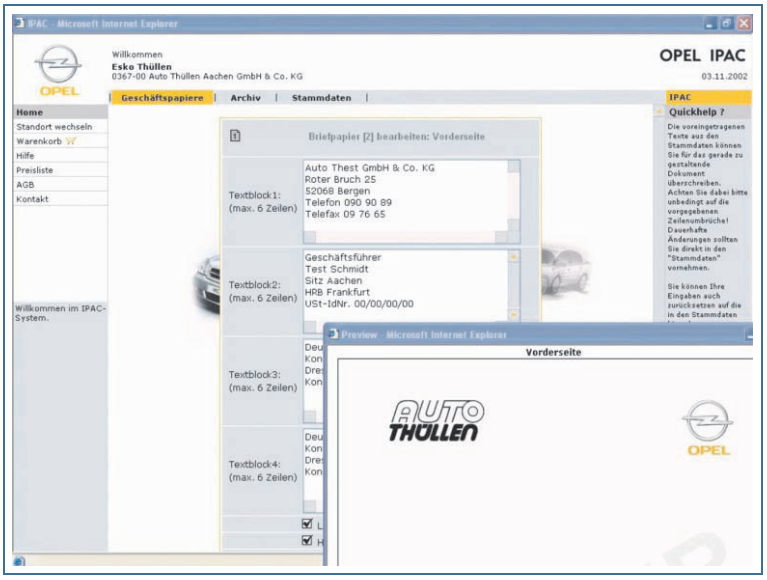


Figure 48
Example of application in the IPAC: Customization of business stationery. In this case, a letterhead

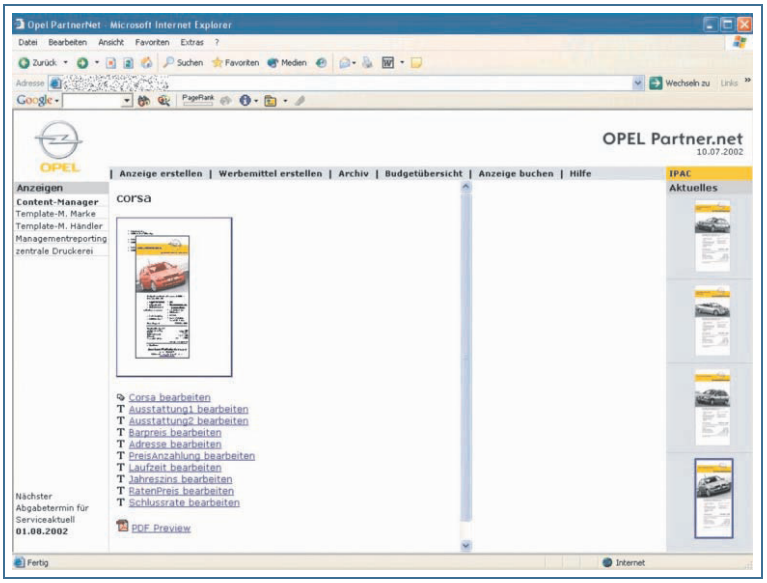


Figure 49
Sample application in the IPAC: Customization of an advertisement. In this case, for the Opel Corsa

Figure 48 and Figure 49 show two areas of application:

- Customization of business stationery and
- Customization of an advertisement.

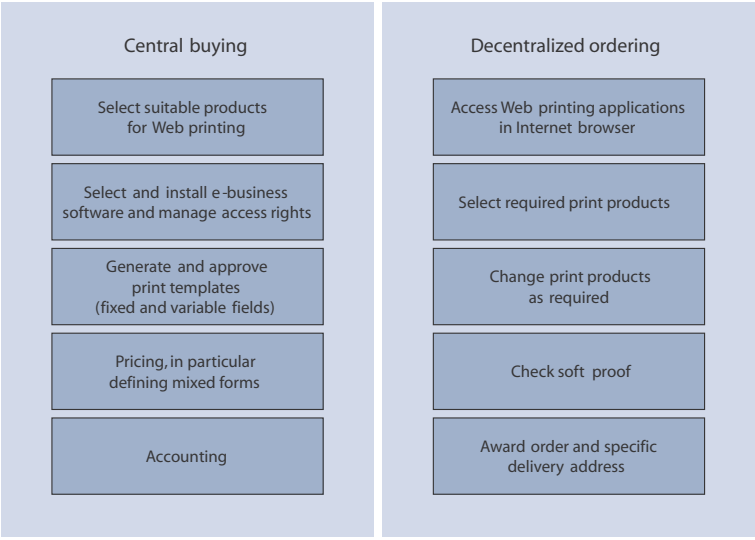


Figure 50
Basic principle and procedure for constructing corporate design portals

During further OPN expansion stages, dealers will have the means to customize and order additional advertising media such as inserts, flyers, handbills and banners. This will mean that numerous media still printed locally by dealers can be purchased centrally with more favorable terms and conditions. It will also be possible in future to use modules do compile and order radio ads, cinema slides and posters. A further expansion stage is planned which will involve customizing cinema ads and setting up a lettershop that can be managed via the IPAC.

The basic principle and procedure involved in setting up a corporate design portal can be seen in Figure 50.

- Firstly, the customer selects suitable products for inclusion in the online ordering system. In most cases, a phase concept will be agreed when constructing the portal. The printed matter which is easiest to customize, e. g. business cards and letterheads, will be introduced first. More complex advertising materials will then follow step-by-step.
- Secondly, a software package is selected and installed and an access rights management system put in place.
- In parallel to this, a print media company prepares the print templates, categorized into fields that can be customized and those that cannot, and complying with customer design guidelines.

- In addition, agreement is reached on the framework conditions for pricing and for defining minimum order quantities and the like when the customer makes decentralized purchases.

After the system has been installed and subsequent users at the customer's have been assigned appropriate access rights, the process for ordering printed materials can be decentralized. The process of purchasing printed materials from the printshop is no longer the reserve of a central buyer. Instead, every authorized employee in the company or branch offices is able to customize, proof, approve and order "his own" printed matter.

2.2.9 Procedure for Introducing Self-directed Customer Systems

The print media company has two options for successfully constructing systems that employ the basic principle of self-service to save process costs and improve customer service:

- Either it has its own business idea that can be implemented through such applications – this is particularly true with digital printshops – or
- The print media company has an initial customer with which it constructs an integrated system. This then serves as a reference customer for disseminating the service.

In both cases, success depends on the systems being integrated into the print media company's technical and business management workflows. Simple Internet cost calculation without an integrated ordering process may be good for a print media company's image for marketing reasons, but it does not deliver process efficiency.

The IRD recommends a step-by-step approach. The in-house network should be improved first – then the external network to the customer. The subsequent course of action could then consist of the following six steps, which could also be carried out in parallel where appropriate:

- Step 1: Ensuring efficient use of the business management system (quotes, acceptance of orders, working documents, delivery notes, invoices, material management).
- Step 2: Improving networking with the production department by transferring presetting data.
- Step 3: Use of an electronic job ticket for making rapid changes to job data without having to search for the job ticket.

- Step 4: Integrating electronic production planning and control, including networking with production via an operating data collection system.
- Step 5: Further JDF networking with the technical workflow: Job header data including times/quantities, machine data collection feedback for press, postpress and prepress.
- Step 6: Constructing an online ordering system for networking with customers.

2.3 Process Efficiency Through Cooperation – The Customer as a Co-producer

Section 2.2 sets out the functions and systems that the customer can use in the quotation and order phase to take charge of various tasks using "self-service" procedures and thereby cut process costs for both the customer and the print media company.

E-business also makes it possible to greatly simplify cooperation through the use of online tools during the creative phase of the production process right up to final print approval.

2.3.1 Changes and Approvals

2.3.1.1 Changes and Approvals in the PDF Document

The central exchange format in the creative phase – PDF format – supports a whole array of functions in the networked production process that facilitate cooperation between the customer and prepress staff. These include the possibility of annotating corrections, a facility which, according to a study conducted at the Seybold Conference in the USA, is already being used by 22% of customers.

Figure 51 shows the correction workflow when using Adobe Acrobat. A layout file from the prepress stage is converted to PDF for approval by the customer, to whom it is sent online. The customer opens the file and makes entries in form fields or adds annotations, comments (complete with audio files or attached data sets from other programs), freehand drawings or highlighted areas (refer to Figure 52 which illustrates the possibilities). In order to avoid the customer now having to return the complete – and in most cases

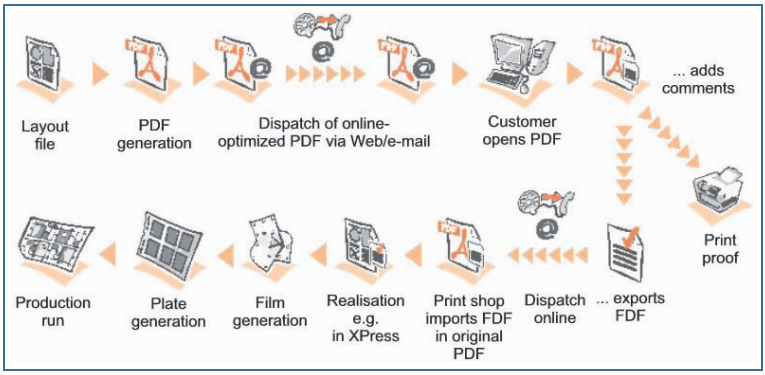


Figure 51
Correction workflow using PDF in the creative phase

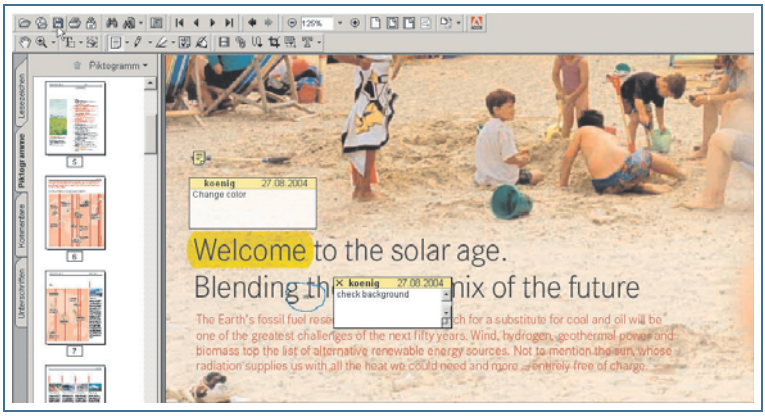


Figure 52
Annotations and comments in the PDF facilitate online cooperation

relatively large – file, the comments file (known in Acrobat as the "Form Data Format FDF" file) can be generated and dispatched separately from the PDF file. Prepress then imports the FDF file into the PDF file and carries out the changes in the layout program.

The process of approving PDF files can be organized and documented using the digital signature function. Like a manual signature, a digital signature identifies a person or company signing a document. However, a digital signature offers more possibilities than traditional paper-based signatures:

- It is possible to define who is entitled to use a signature. A person who does not have the appropriate authorization will not be able to apply their signature in the first place
- It is possible to prevent a file leaving the customer's premises it does not have authorized approval.
- Additional information on the person applying their signature can be saved and the entire signing process documented.

2.3.1.2
Modifications and Approvals Within the Team – Example of Synapse Insite

Synapse Insite is an Internet portal that can be used to extend the Creo Brisque and Creo Prinergy workflow systems. Creo developed the portal in order to provide all production partners and customers with access to a shared, secure database with a view to cutting production cycles and associated costs. This solution prevents scenarios where PDFs are sent backwards and forwards between the various parties in the process, without any version monitoring taking place and with sundry annotations being added by the parties concerned. Such a scenario is very prone to error and involves enormous time and effort in the coordination process, a situation that this solution is designed to eliminate. A positive side effect of such systems is that the records made during the coordination phases provide documentation for the extra work performed during the correction cycles, meaning that this input can be billed more easily.

Synapse Insite is linked online to the workflow system. As soon as production pages are processed there, they are available immediately via the Internet portal to all project partners and customers. It is also possible to set up "pro forma" jobs via the Internet portal in order to upload pages before the job has been created in the workflow system. Since each page is assigned to precisely one job, it can be located and accessed quickly and easily during a correction session.

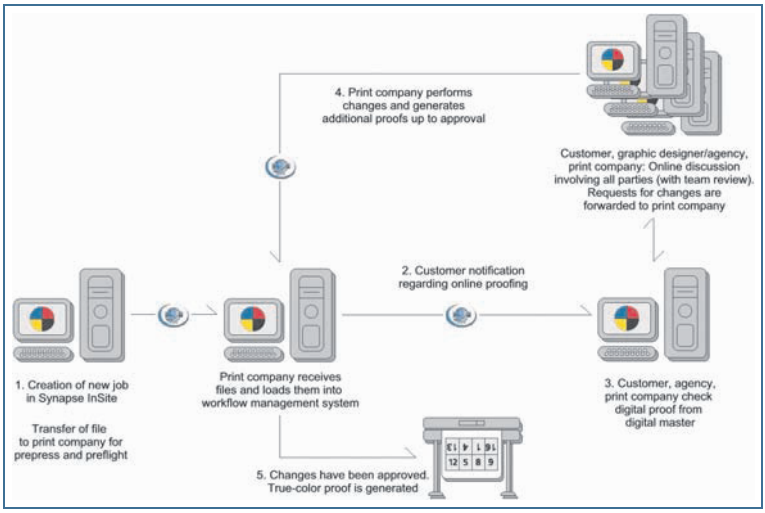


Figure 53
Workflow for coordination processes using the example of Creo Synapse Insite

The personnel involved in the approval cycle for the particular job are selected from a list. The persons selected are automatically sent an e-mail stating that they are involved in the correction cycle. For example, if the workflow operator has finished processing the first 16 pages of a catalog and now wants to start the correction cycle, he changes the page status in the workflow system to "Approval required" and the system automatically dispatches an e-mail to all selected persons. If several persons have been selected for correcting individual pages, the page in question is not assigned the status "Approved" until everyone involved has approved it.

Synapse Insite provides several variations for the actual coordination process. Let us take a closer look at the "Team Review" version.

The Team Review function invites everyone involved to a simultaneous discussion of the layout pages. External users are authorized via user names and passwords and can then move around freely in a secure environment. All they require to link in to the online workflow is Internet access and a browser. Up to six persons can take part at any one time. All transactions are conducted in real time. Once a correction session is finished, a full report on the session is drawn up and can be accessed as a PDF file via the Internet portal. The new status of the corrected page(s) is automatically e-mailed to the persons involved. The workflow operator can see this interactively in the workflow system, but is also sent an e-mail

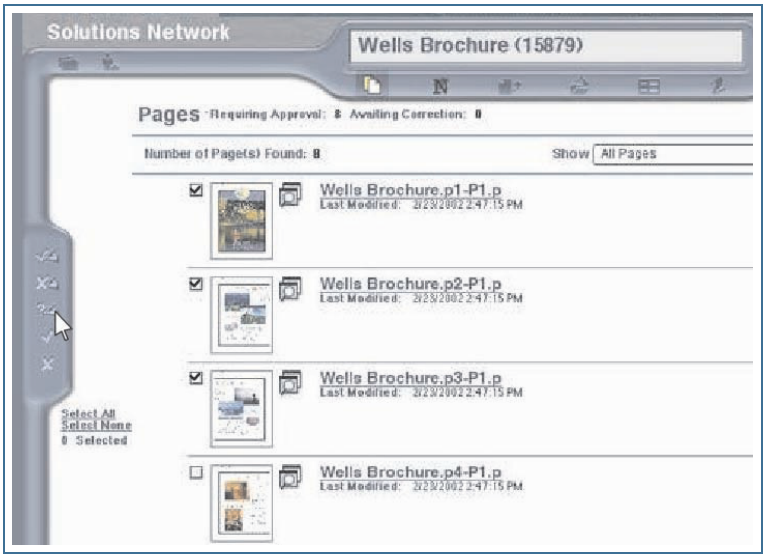


Figure 54
Extract from the demonstration version of Synapse Insite: Selection of the layout pages for discussion in the team review
www.creo.com

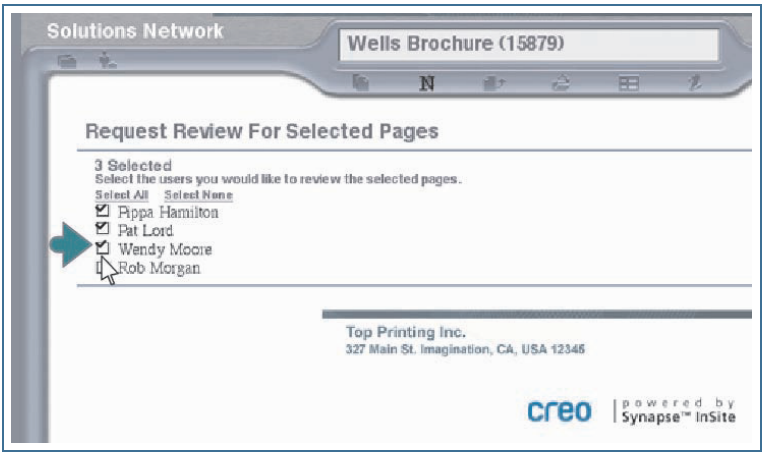


Figure 55
Selection of the persons involved in the team review www.creo.com

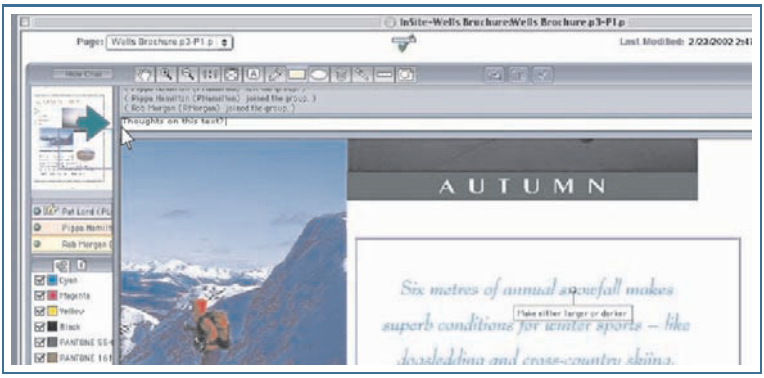


Figure 56
Communication options during the team review www.creo.com

to ensure that he is aware of the new status even if he is not currently working on the job in question.

The persons involved in the coordination process can assign the following statuses on a page by page basis: “Approval Required”, “Approved”, “Waiting for Correction” and “Rejected”.

The following illustrations show extracts from a Creo demonstration video. Figure 54 illustrates several pages of a project. The project manager selects the pages that are to be discussed in the team review.

Figure 55 shows the choice of partners involved in the review, while in Figure 56 we can see various options for communication during the session, namely color density checks, separation lists, page measurements and free text in the form of chats. Figure 57 shows an extract from the documentation for a review.

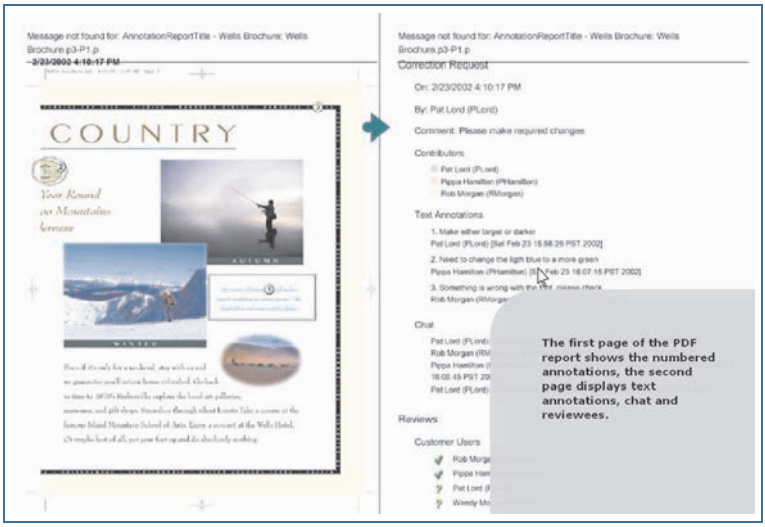


Figure 57
Documentation of a team review
www.creo.com

2.3.2 Online Editing Systems – The Example of StreamGuide Web

The previous chapter described how the customer can "attach" his annotations and approvals to the PDF document and thereby simplify interaction with the media service provider. We also saw, using the example of Synapse Insite, that making data available on a central server can greatly simplify the version management process. The customer and service provider will then always be talking about the same file on the server – i. e. the latest version.

If we link up these two concepts, namely digital approval and central data management, with the concept of "Web printing" – in other words the possibility of the customer being able to change certain parts of the copy himself – then what we have is an online editing system.

The basic principle can be seen in Figure 58. In step 1, the media service provider enters the designed pages into the system. These pages have fixed and editable areas just as in Web printing. An e-mail generated automatically notifies the customer and/or production partner that the pages have been entered (step 2). In step 3, the customer accesses the documents on the central server, checks them, adds any changes in the form of comments and – now comes the real difference between an online editing system and the applications described in Section 2.3.1 – performs the changes himself. The changes will generally be to the text. In theory at least, these systems also allow the customer to exchange images

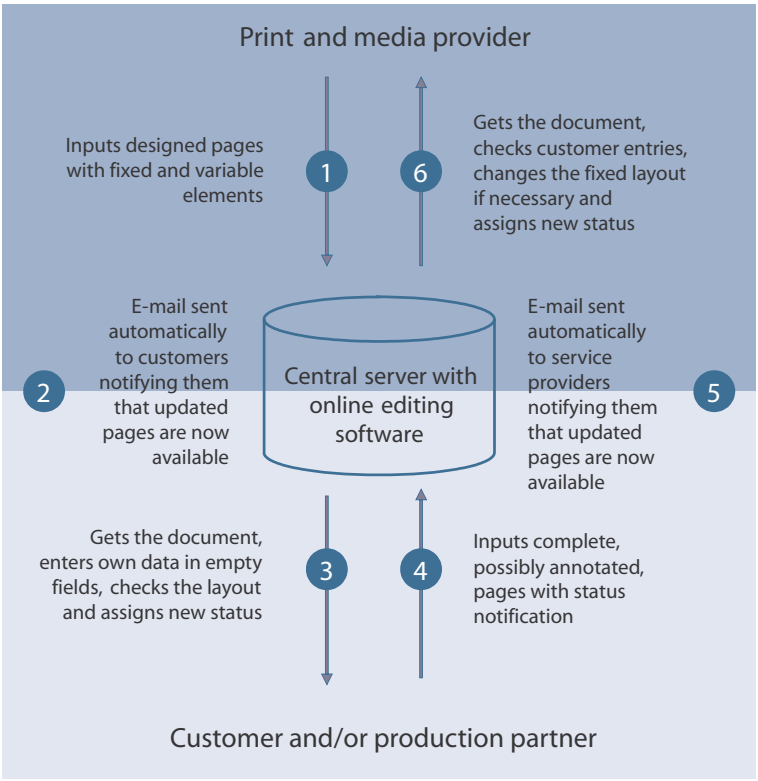


Figure 58
Basic principle for networking the design processes for printed matter using an online editing system

and graphics and to check the effects this has on the layout. After these changes have been made, the file on the server of the print media company is linked automatically to the layout software and the customer is provided with a PDF as a soft proof for checking purposes.

Applications of this type are already being used in two areas:

- Catalog design work: The texts are entered by the customer, while the media service provider takes care of the graphic layout and image design.
- Multilingual publications (language versioning): The languages are edited by the customer or by a network of translators; the media service provider is responsible for the graphic layout and adapts it if necessary to accommodate translations that are too short or too long.

Taking the example of the StreamGuide Web online editing software, the following illustrations demonstrate how the customer or translator can use the software to facilitate language versioning.

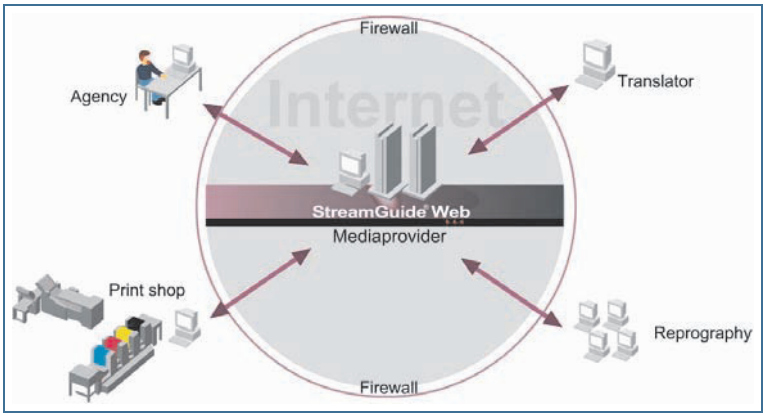


Figure 59
Co-production with central data management
www.prinectportal.de

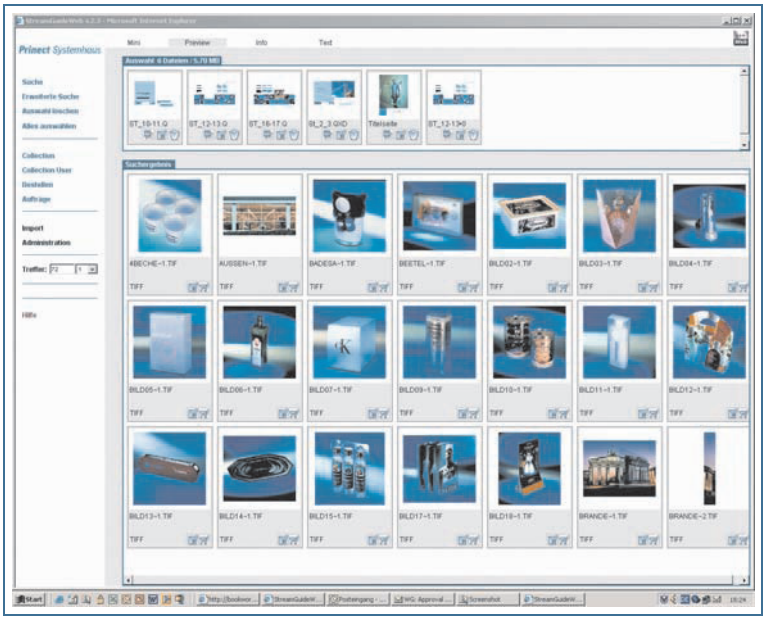


Figure 60
Application example: StreamGuide Web. In this case, selection of the pages to be processed
www.prinect-portal.de

Figure 59 shows the fundamental principle of bringing everyone involved in the production process together around a single "table", in this case a server.

Figure 60 illustrates how the customer selects a file, e. g. a QuarkXPress file, for processing using his Web browser. This file contains editable text elements (cf. Figure 61) which, following input, are output directly as soft proofs in order, for example, to check that the texts are of the correct length. This function, which has already been explained under the term Web printing in Section 2.2.4, is known as "Web editing".

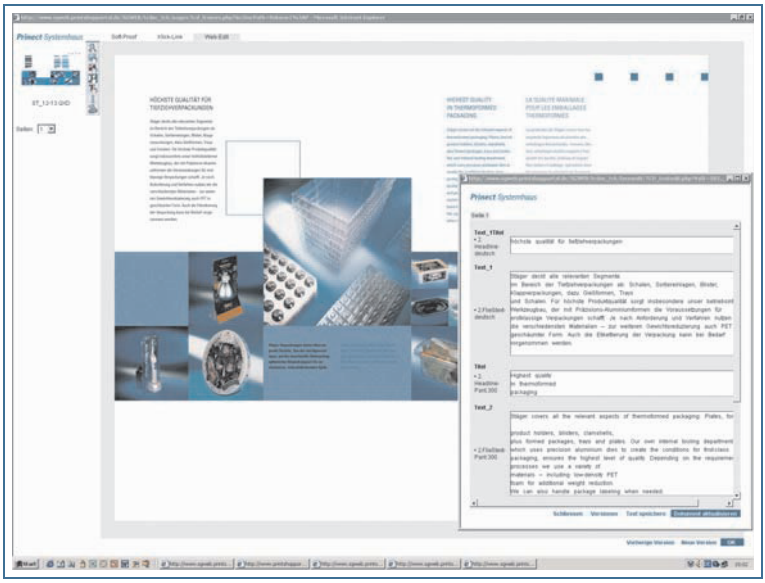


Figure 61
Application example: StreamGuide Web. In this case, entering translations

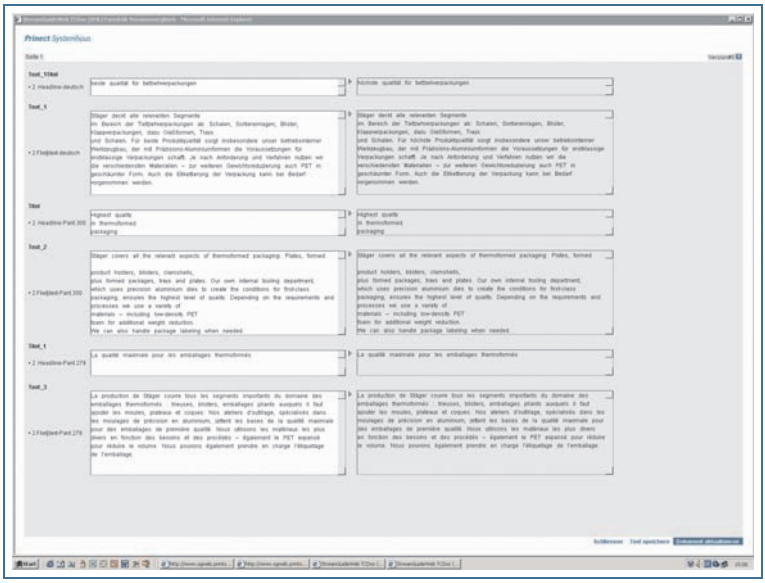


Figure 62
Application example: StreamGuide Web. In this case, facilitating text comparison for a translator and version monitoring

Figure 62 compares old and new texts and demonstrates the version monitoring facility. Although there is only one – i. e. the latest – file on the server, all the intermediate steps in the process can still be retraced.

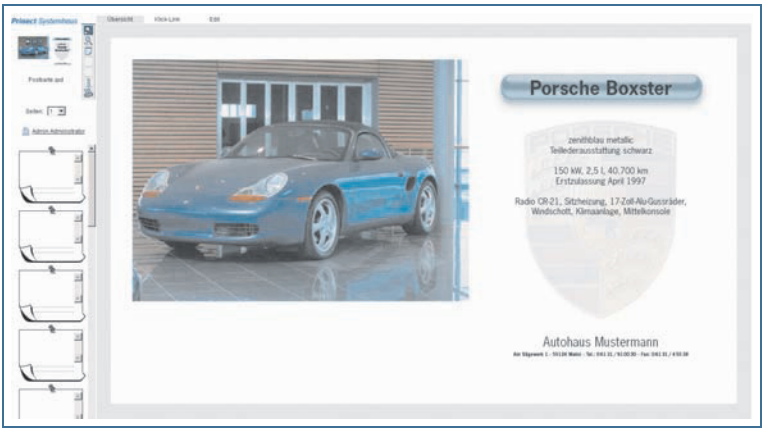


Figure 63
Application example: StreamGuide Web and advertisement design. In this case, soft proof of an editable advertisement

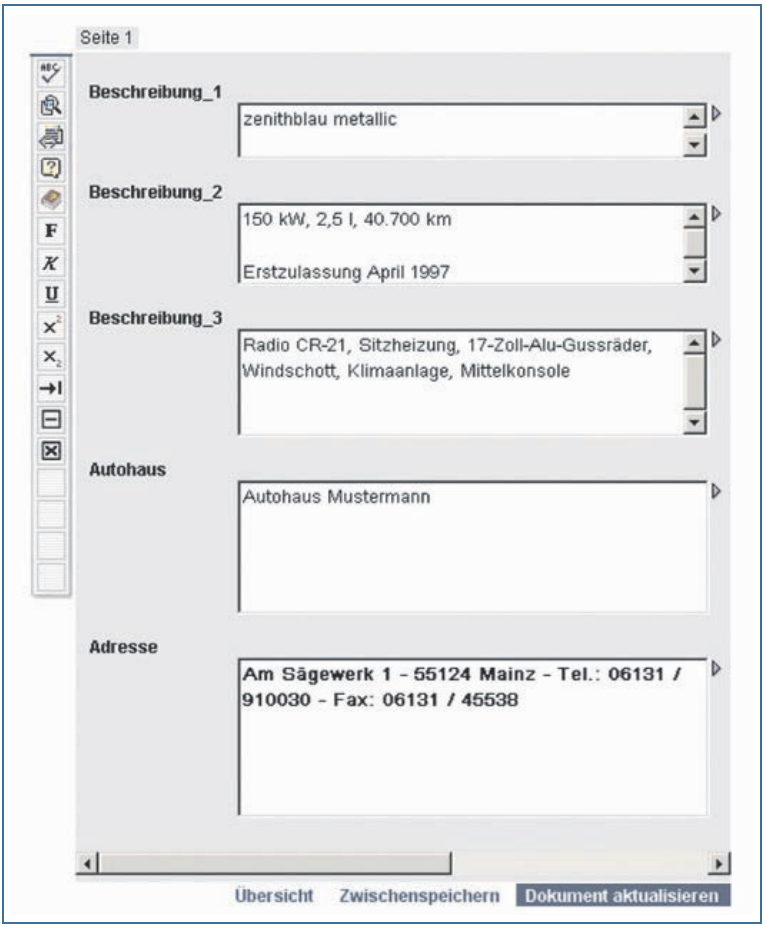


Figure 64
Application example: StreamGuide Web and advertisement design. In this case, text changes

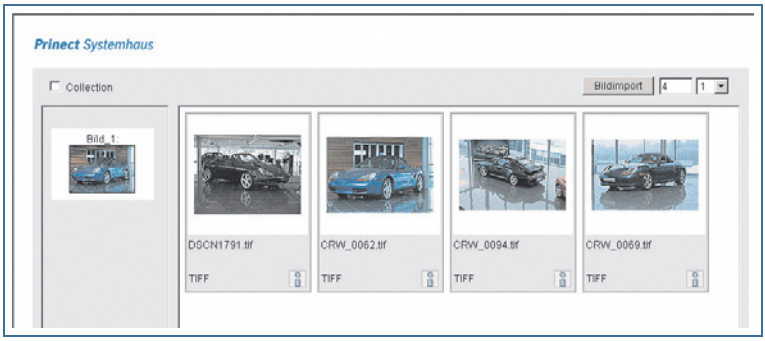


Figure 65
Application example: StreamGuide Web and advertisement design. In this case, exchanging images

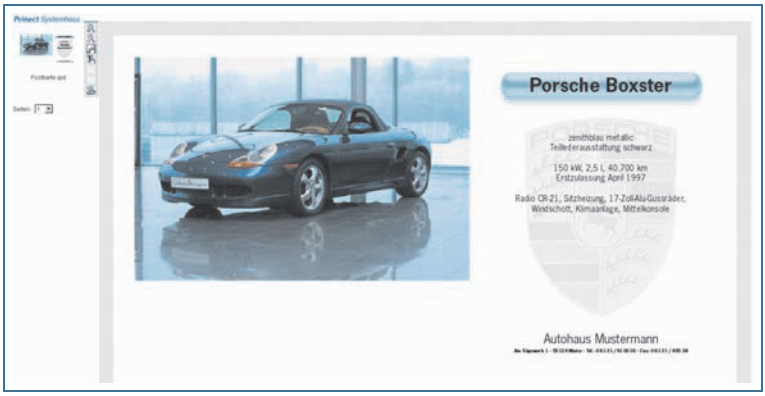


Figure 66
Application example: StreamGuide Web and advertisement design. In this case, soft proof of the modified advertisement

Language versioning is only one example of how Web editing functions can be used. The illustrations, Figure 63 to 66, also use the example of the StreamGuide Web software to show how advertisements can be designed and images exchanged.

2.3.3 Remote Proofing

A proof provides a means of checking intermediate results and functions as a reference for the subsequent print operation. There are different types of proof – the page proof (design proof, content proof) for checking the individual page, the form proof (imposition proof) for checking the pages with respect to each other, and the color proof for ensuring the correct colors are used (cf. Table 3).

"Remote proofing" (also known as online proofing) involves outputting identical true-color proofs at different locations (and thus logically on different devices) from the same digital database. Depending on the particular production partner, output can be

Table 3
Proof designations and their function for quality assurance

Designation	Function
Page proof	Checking intermediate results (not true color)
Form proof	Checking the imposition layout for print approval
Color proof	Checking the color for print approval

either on screen in the form of a soft proof or on (special) paper as a hard proof.

The benefit of remote proofing as an online service is that it eliminates transit time between the customer and printshop or agency – in other words, the production throughput time can be shortened. However, this means that the proof must be generated by both the sender and recipient. This in turn means that the units, the materials used, the color profiles and the lighting conditions under which the results are viewed must be coordinated. This highlights one drawback of this method, namely that both partners need to generate proofs and this naturally doubles the proofing costs, at least with hard proofs.

In principle, remote proofing is nothing new. In gravure printing, for example, it is widely used where different parts of a magazine need to be printed in parallel at multiple locations. The challenge facing e-business is to make remote proofing available to customers who themselves do not have the same know-how, powerful data lines or the hardware and software equipment as production partners in the same industry.

Cooperation with customers can be greatly facilitated by ensuring that heir monitors are calibrated. While soft proofs do not

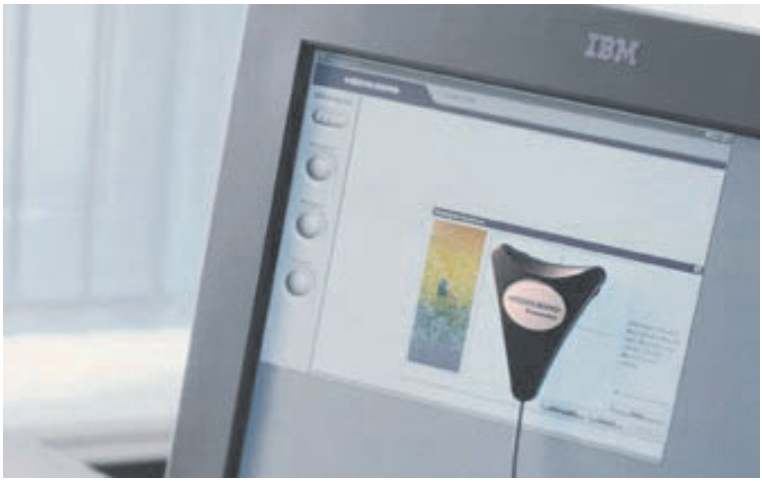


Figure 67
Calibration of a monitor for color-consistent soft proofs using the example of ViewOpen® from Heidelberg

provide true-color results, output on proof printers is generally dispensed with for many correction cycles in the creation phase.

Quality color monitors whose color spaces need to be described are required in order to output soft proofs. Special software solutions for generating ICC profiles (cf. Figure 67) are available for this purpose.

ICC

The ICC (International Color Consortium) provides a forum where manufacturers of prepress products come together to promote color management, in other words device-independent processing of color representations.

ICC profile

An ICC profile is a file which is compatible with the ICC standard and which describes the color reproduction of an input or output device and color spaces.

Color management

Color management is the term used for controlling color reproduction in a digital graphic arts production process. The various input and output devices ranging from scanners to printing presses use different color spaces depending on the particular device. To standardize color reproduction beyond the confines of the production process, color profiles are generated for the devices and processes involved. The coefficients required for the conversion are calculated from the color profile linkup. Colors from one color space that cannot be represented in another color space are approximated as far as possible.

In the majority of cases, true-color remote proofing is only possible when outputting hard proofs if both parties involved in the process are using the same proof printers and the same proof material. In addition, the calibration process needs to be aligned.

Proofing unit suppliers provide a number of different options for remote proofing with hard proofs.

- One solution is to have remote proof printers calibrate themselves automatically (Closed Loop Calibration). A sensor in the device measures the fields of a special calibration print. The software identifies deviations from the target values and corrects

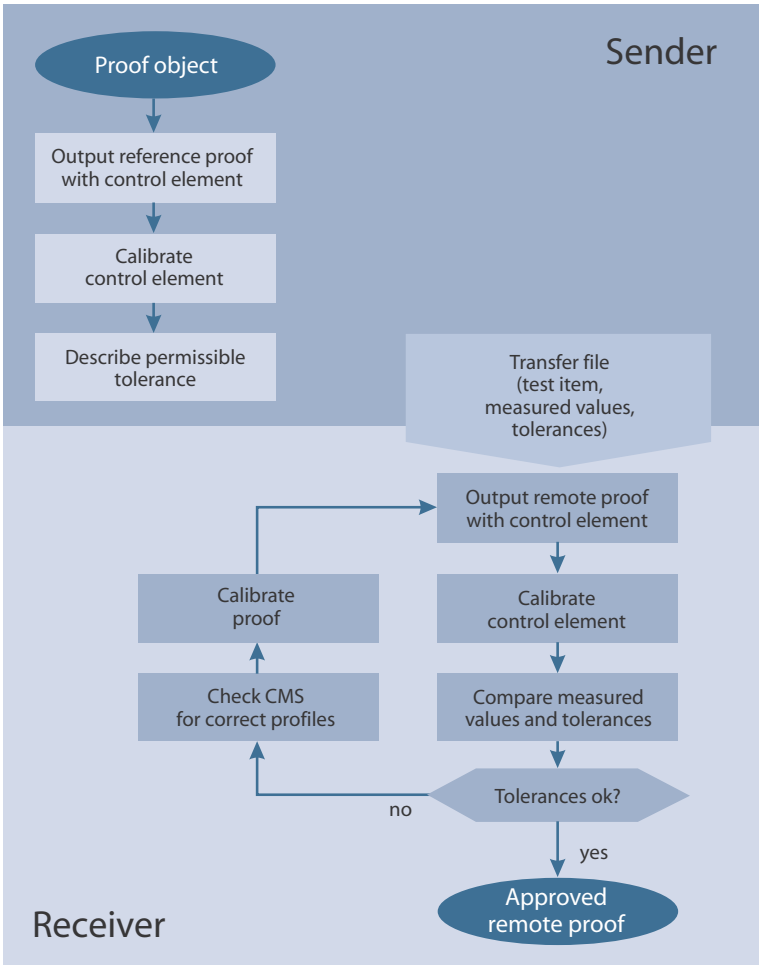


Figure 68
Workflow for remote proofing with transmitted measurements

the calibration curves if necessary. This is the solution chosen by, for example, Hewlett-Packard.

- A second solution is that adopted by companies including Bestcolor. The recipient and sender exchange and compare their measurement data. Various degrees of automation are possible for the data comparison process and for correcting the remote devices. The principal workflow is the same, however (cf. Figure 68).

The sender creates his reference proof with the relevant control elements and calibrates these. He also defines the permissible tolerance. The proof itself, the measured values and the tolerances are

then transmitted. The recipient outputs his remote proof – again using control elements. He calibrates these elements and compares them with the sender's data. He then either approves the proof or performs corrections. The software automatically e-mails the sender to inform him whether the color difference between the two printouts lies within the required tolerance. PDF is used as the data exchange format for the print files, while JDF is used for the measuring results.

- A third solution is to bring in a service provider for the certification process, who will guarantee the stability of the remote printer. This approach is the one taken by Dupont with iCertification in conjunction with the DuPont Cromalin Digital System, a system for Internet-based proof certification. To this end, DuPont has installed a server for collecting and documenting all remote proofing jobs sent and received. This server performs automatic calibration, comparison and evaluation of the measurement results. If all data lies within the tolerance range, the server automatically issues a certificate for the remote proof. This procedure presupposes that the proofing systems used by the sender and recipient are identical, however.

Currently, remote proofing is generally only used where the sender and recipient both use the same proof printer, the same ink and the same printing stock. To ensure a true-color proof, is also important that the same light source is used at both ends, since the laws of metamery naturally still apply.

3 E-business for Buyers

3.1 Procurement Processes at the Customer's and the Potential for E-procurement

It's not just print media companies that are looking to increase their efficiency in managing print jobs – this is a goal shared by all innovative customers. Indeed, many of the e-business solutions listed in Chapter 2 were developed at the customer's initiative.

Nowadays, print buyers from advertising agencies, publishing houses and marketing departments in industry and public administrations have to manage print jobs not just from a single printshop, but from a whole range of suppliers. The buying strategy they choose depends heavily on the importance of media products for their business operations. Customers who attach a great deal of importance to buying media products will want a far closer degree of cooperation with suppliers than customers who only buy media products sporadically.

An ABC analysis[4] is conducted (cf. Figure 69) to decide the input to be invested in improving process efficiency in the purchasing section. This analysis assigns all suppliers to one of three groups – A supplier (accounting for 70–80% of purchase volume), B supplier (10–15% of purchase volume) and C supplier (remaining 5–10% of purchase volume).

The basic concept behind this method of analysis is what is known as the "Pareto Principle". Vilfredo Pareto, an Italian economist and sociologist researching in the 19th century, turned an interesting everyday observation into a basic theory. He noted that, within any population, a component small in number is responsible

[4] The ABC analysis will be familiar to anyone who has studied business management. Companies in the print media industry will use it primarily to assign customers to groups (A, B and C customers) and less for selecting suppliers. This is because a print company will generally have far fewer suppliers than other industrial businesses, and in reality will only have an A supplier group – namely, paper suppliers.

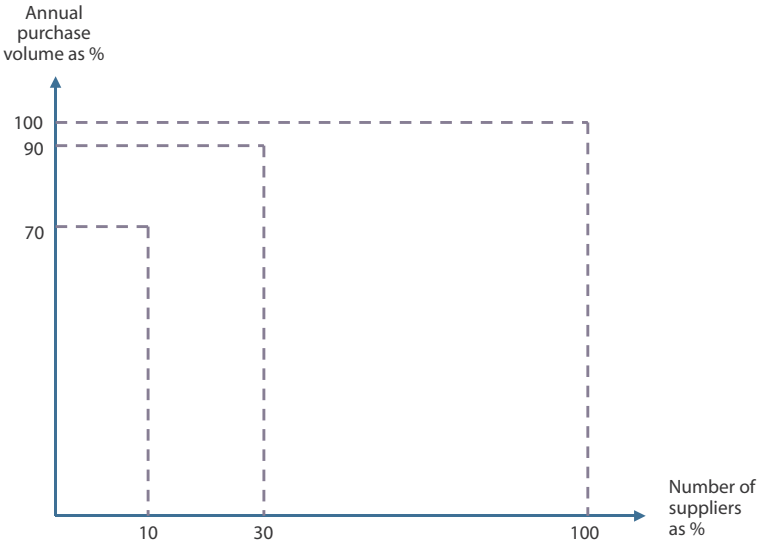


Figure 69
ABC analysis based on the example of supplier classification

for a proportionately greater share in terms of value generated. Take a few examples:

- 20% of customers account for 80% of sales
- 20% of errors cause 80% of waste
- 80% of problems are a result of 20% of all causes

Translated to suppliers, the Pareto Principle might mean that 80% of the purchase volume is accounted for by 20% of the suppliers.

Test out this theory on your own operational data and you'll be amazed by how accurate it is!

When it comes to investing in plant optimization, this theory suggests that managers should concentrate on the few areas that are vital to the company, since this will make a far greater contribution to process efficiency in the company as a whole than focusing on processes that are less important. In purchasing terms, this means that the 10% of suppliers which account for 70% of the purchase volume should be treated quite differently from the suppliers who deliver the remaining 30%.

For *publishing house customers*, the print media company is an A supplier. This means that managers in the publishing house focus on the efficiency of processes involving their few A suppliers. Most suppliers will have concluded framework agreements with the publishing house. The possibilities offered by database publishing and content management and the synergies deriving from cross-

media production are being exploited more and more. E-business solutions, particularly in the area of co-production, such as online editing systems, are especially promising.

From the perspective of *advertising agencies*, print media companies are also classed as A suppliers since they cooperate very closely with the agencies. Advertising agencies also have a large number of C suppliers among print media companies since, depending on the particular publicity job, they often buy in very specific advertising goods. Framework agreements are almost never concluded with C suppliers, e.g. pad printers, since the demand is sporadic. Online market places which enable customers to find suitable suppliers quickly and allow fast price comparisons play a large role in these scenarios.

For other customers from *industry and public administrations,* it is reasonable to assume that print media companies are just one of many C suppliers. This perhaps explains why sales staff in print media companies find it so extremely difficult to sell what, on the face of it, are process-optimizing e-business solutions to this customer segment. The possibility of employees themselves being able to generate and check business cards from any of the customer's terminals using Web printing solutions and placing an order for these is clearly a process-optimizing development for customers. Suppliers, however, may often find it difficult to locate a manager at the customer's who is able to spot this opportunity. It is simply not important enough for the organization as a whole.

Nevertheless, there are two key trends in these customer segments that suggest it will become far easier to push e-business solutions successfully in future:

- When profit margins are low, even smaller process optimizations at C suppliers take on an increasingly important role and
- The importance of information accompanying products is increasing as production batches become smaller and smaller. This is a trend that is indicative of the growing importance of digital printing – and digital printing in particular is ideal for e-business solutions aimed at *self-directed customers.*

Figure 70 provides an overview of the various phases in the procurement process from the perspective of the print buyer, the activities required in the individual phases, and the potential that e-business – known in this case as e-procurement – can offer these processes.

Most solutions have already been introduced in the preceding chapter. Drawing on the cooperation between buyers and a large number of print suppliers, two e-business solutions for purchasing

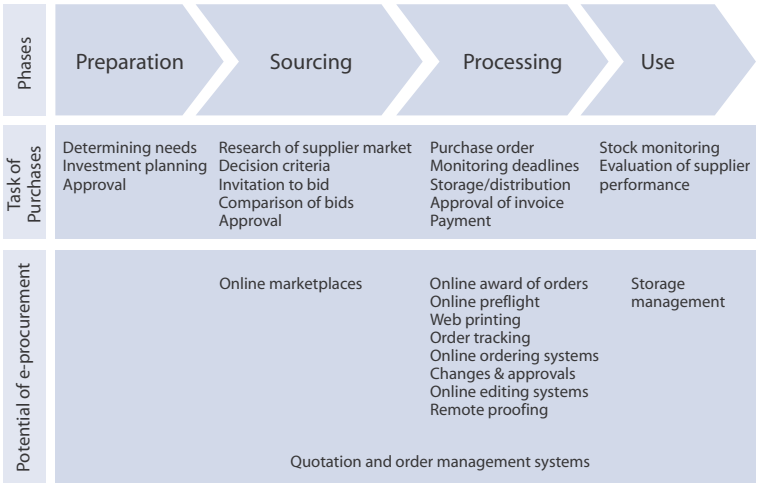


Figure 70
Phases in the procurement process and e-procurement potential

will be added in this chapter: Online market places and order management systems. These applications are intended to facilitate the selection process, price comparisons and cooperation with multiple suppliers.

3.2
Online Market Places – Selling via Print Brokers

"The dot.coms are coming!" was a common headline in magazines in 1999 and 2000.

The dot.coms referred to were, of course, companies whose business ideas were based solely on providing services via the Internet. Where such services involve bringing together suppliers and customers, the result is an "online market place".

To illustrate the business principle involved, let us take an example from another branch of industry. One very successful dot.com company – and one which most readers will be familiar with – is the online auction house ebay.com. The business idea behind ebay.com is to bring together sellers and buyers of used goods via a website. A seller, for example the owner of an espresso machine, enters the data, i. e. the minimum price he is looking to achieve, and possibly a photo of the machine on the eBay site. Potential buyers locate the item and can increase their bids in small increments. Once the auction has been concluded a few days later, the highest bidder receives an e-mail from eBay stating that he has offered the best price and should contact the owner of the espresso machine using the e-mail

Figure 71
Example of an online market place
www.printlocal.com

address supplied by eBay. This is the end of eBay's involvement. The buyer asks the owner how he is to make payment, e. g. bank transfer in advance, and sends his delivery address. Once the seller has received payment, he then posts off the espresso machine. The transaction is a purely private one between the buyer and seller. eBay only functions as the broker and receives a sales commission from the vendor. The postal services also do well out of this private transaction.

The business idea of the market place is similar in the print industry. A print buyer uses a structured request form to place an inquiry on the dot.com platform. This platform also provides a vehicle for printshops to set out their portfolios and profiles in a database. If the inquiry matches one of these profiles, the printshops receive an e-mail indicating that they can make a bid. If a transaction comes about, the broker receives a commission of between 2% and 5% of its value.

But wait, you will say – a print product is not a coffee machine but rather a product that requires explanation and may well involve

numerous complex services! This is something that can't simply be bought and sold via the Internet – you surely need to call the buyer before making a bid!

That's quite true –which is one of the reasons why dot.coms in the print media industry have not developed with the speed envisaged back in 2000. Indeed, most dot.coms have already disappeared from the market.

Online market places – the customer's perspective

"I'm now handling nearly all my production work in this way," says Simone Pesch, Product Engineer at ACN Werbeagentur in Saarbrücken, Germany. But she doesn't just use www.orderbook.de for awarding print jobs. The site offers special masks adapted to the particular product where the relevant parameters can be entered for everything from photographic work and specialized publications, e. g. for trade shows or banners, to multimedia and audio production. A special text box is provided for special needs such as surface finishing of print products. The e-service helps to save time. "In the old days, I needed to send out five or six inquiries and often had to wait quite some time for quotes to arrive," explains Simone Pesch. The online inquiry system not only gets the quotes to her far faster – they usually start arriving after only a few hours – they are generally cheaper too. This cuts the agency's production costs by an estimated 5 to 10%.

"Printshops can seek out the projects they are specialized in and can therefore offer a good price," says Simone Pesch, explaining why quotes are more attractive. [. . .] There is general unanimity that, all in all, the benefits outweigh the drawbacks, since the search for a suitable supplier is not only faster and easier, but the process of finding specialized companies, and not just local ones, is also far easier via the Internet: "I would otherwise never have come across some companies," agrees Branislav Ljubicic, who is enthusiastic about using Internet brokers to complement conventional ordering processes. He has already given follow-up orders to some of the new contacts found through this avenue. "With all this optimism on the part of the agencies, it only remains to be seen whether the printshops will continue to play the game – after all, they not only face fiercer competition but also have to pay a commission to the online service provider" (from Page 09/2001).

With regard to printshops, the Bundesverband Druck und Medien (The German Printing and Media Industries Federation) revealed in its E-Commerce Study 2004 for Germany that 51.5% of the printshops surveyed are willing under certain conditions to use market places, but some who already have experience of this sales channel doubt its effectiveness. Page magazine states: "Many companies now believe that, with an estimated return of just 1%, the outlay is scarcely worthwhile."

However, a number of dot.coms have also survived – so there does appear to be some demand (cf. box).

The online market places that are still in existence have broadened their portfolios. In addition to their core business of bringing suppliers and customers together, they are now also offering Web-based platforms for managing the entire procurement process – from selecting suppliers and comparing quotes to processing the order in collaboration with everyone involved in the process.

They are thus developing into Web-based print management systems. Online market places such as httprint, noosh or printcafé, which began life as dot.coms, have moved away from the market place sector and are now offering sophisticated Web-based order management systems that are tailored specifically to the print media industry. The basic functionalities of these are explained in the next chapter.

3.3 Order Management Systems – for Greater Purchasing Efficiency

Web-based order management systems are intended to provide support to two key processes in the field of e-procurement:

- Faster selection of suitable suppliers in the sourcing phase and
- Easier cooperation between the various parties involved in the implementation phase – namely, between the customer's central and local purchasing operations, the agency and the print media company.

Compared with online market places which attempt to provide buyers with the largest possible number of potential suppliers, order management systems are limited to the suppliers that the buyer has entered onto his own shortlist and stored as profiles in the software.

3.3.1
Selecting Suppliers

The first step is to enter the order into a structured form – similar to those used by printshops when orders are awarded directly online (cf. Section 3.3.2). By comparing the data, the software is able to identify which of the regular suppliers has the technical expertise to handle the order. The list of suppliers is displayed.

The next step involves the buyer selecting the suppliers from the list that he wants to receive a quotation from. These suppliers are automatically sent an e-mail containing access data for the Web-based order management system. They then enter their quotations in structured form into this software system. The buyer receives a clearly structured list of quotations from several suppliers. Figure 72 depicts the Printcafé order management system to illustrate what form this could take. In this example, the two printshops "CS Printer" and "printer1" have been asked to provide quotations. The quotations have been received and the buyer is now selecting a supplier – in this case CS Printer.

The various parties involved in the decision-making process, such as the central purchasing department, also have easy access to the system. Once the order and the supplier have been approved, the order can be placed directly from the system.

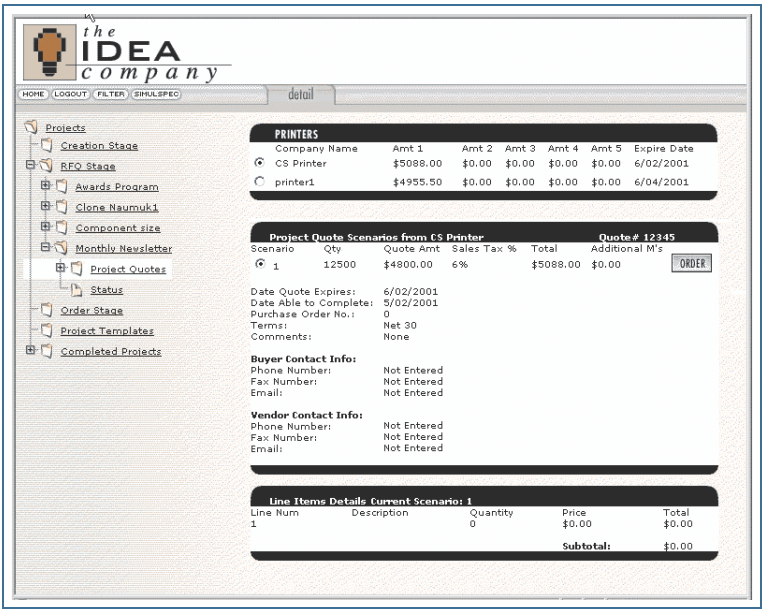


Figure 72
Overview of quotations using the example of software from Printcafé
www.printcafe.com

3.3.2
Order Processing

During order processing, e-procurement platforms of this type provide an overview of all activities of the various persons involved in the process. Figure 73 illustrates this using the example of the Noosh e-procurement software which, like Printcafé, has been optimized for processing print jobs.

A system of this kind can be extended step by step into a "supplier management system". If all e-mail contacts of everyone involved in the customer's purchasing procedure are handled via the software, everyone knows what everyone else is doing – an important precondition for cutting costs in the purchasing process.

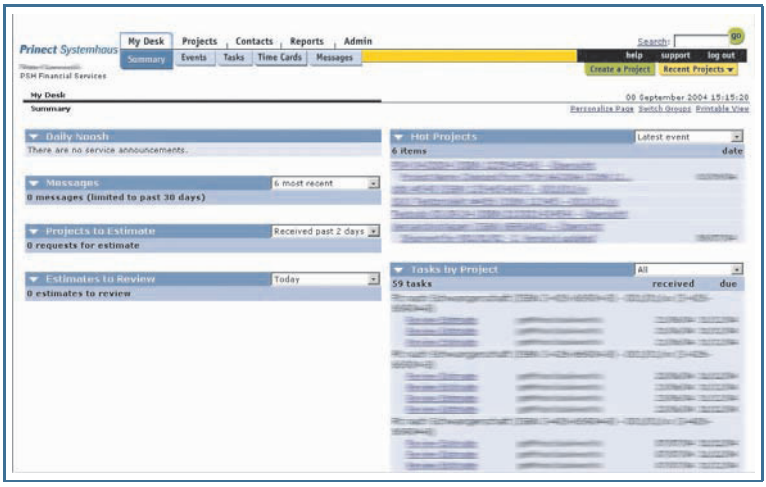


Figure 73
Overview of a print project using the example of software from Noosh
www.noosh.com

4 E-business for Printshops

4.1 Marketing and Sales

Marketing experts often say that for every dollar you invest in your company, you need to invest another one to publicize the fact. This credo is ascribed to Henry Ford. Henry Ford, of course, produced automobiles – a classic product for end users, in other words a B2C business.

B2B marketing, i. e. cooperation between two companies, takes a somewhat different form. Bending this credo slightly, perhaps we should say: "Before you invest a single Euro in your business, it's best investing a minute of your time to understand your customer's business." For B2B companies, the sales process – involving direct contact with the customer – is far more important than marketing.

Differentiating between marketing and sales

The term "marketing" should be reserved for all activities designed to make your company known to customers who are not yet familiar with your business and/or have not yet shortlisted you for a planned job.

"Sales" on the other hand refers to all activities related to actually winning orders from customers who are already familiar with your company. This includes both new customers and regular ones.

The e-business solutions already described will help the sales department maximize customer loyalty and win new customers. Many innovative print media companies have reported that e-business solutions have helped them "get one foot in the door with new customers". In such scenarios, it was often not the e-business solution central to the acquisition phase that opened the door, but

rather a perfectly normal print job. The company was elevated to preferred supplier status because it had shown itself able to "see things through the customer's eyes" and had therefore commended itself as a service provider.

Consequently, even if sales contribute more than marketing to a company's success in B2B business, every print media company needs to be able to get across where its strengths lie if it is to win the attention of new customers. The Internet provides an innovative opportunity to tell people about the talents of your business with far less input than ever before.

4.1.1 Your Own Website – Winning New Customers and Retaining Old Ones

"A shrewd schoolboy saved a British printshop from bankruptcy during a two-week placement at the company. His suggestion of switching the company's sales system to the Internet proved to be a masterstroke. The 17 year-old replaced the company's existing strategy of conducting marketing by phone and snail mail with an attractive online website. The company quickly received an order from the USA worth £70,000. It now expects further revenue running into millions. The schoolboy has decided not to accept the company's offer to become head of the new marketing department in the USA, however, preferring instead to continue his studies in Liverpool" (report in print process 13/01).

That's how effective the Internet could be – though it has to be said that this report is now several years old. For potential customers, the Internet has already become a standard tool when searching for new suppliers, and virtually all print media companies now boast extensive websites that they hope will be found by potential customers. But today it is no longer just a case of "being found", i. e. winning new customers. As described and illustrated by numerous examples in Chapter 2, the Internet is also a collaborative tool. In other words, it can also be used to win customers' loyalty.

4.1.1.1 Contents of the Website

Figure 74 shows a typical structure for the website of a printshop. There are two primary objectives that the website is intended to achieve – to win new customers and retain existing ones.

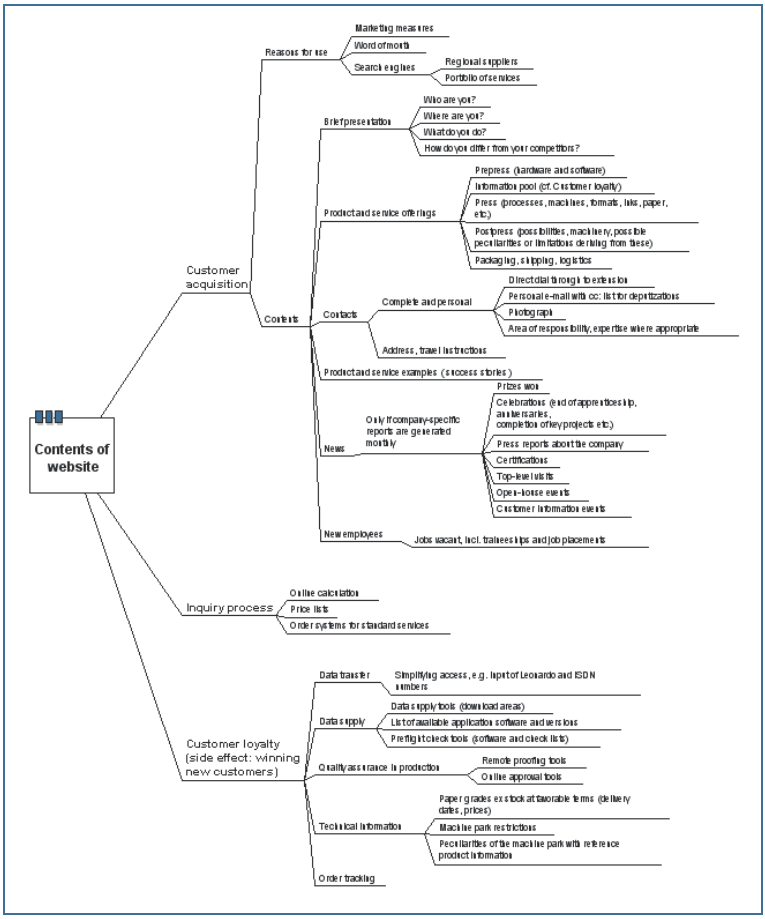


Figure 74
Example of a website design for a print media company

These two goals are complementary. Measures to retain existing customers, for example order tracking facilities, are only available to regular customers and are therefore password-protected. However, the fact that the service is available and the benefits it brings can be illustrated on the website to attract potential clients. Measures designed to boost customer loyalty can thus also have a positive side effect in winning new customers.

Showing examples of complex services that are highly customized and geared to the needs of existing customers involves considerable input. Various options are possible – and can often be pursued in parallel:

- Accounts of successful projects with reference customers in the form of "success stories". A print company that wants to show that it is not only able to produce high quality catalogs but can also customize them and handle all the entire warehousing and mailroom logistics may find it difficult to get this message across. Success stories are a useful vehicle for augmenting and enriching the usual product descriptions.

Success stories

Success stories are relatively detailed descriptions of projects that have been successfully implemented for customers. They are particularly popular marketing measures in industries that sell complex services that require a level of explanation (e. g. suppliers of customized software developments). In order to be successful, they not only require the agreement of the customer to use him in its publicity campaigns, but also need to be prepared using professional journalistic techniques.

- Use of a video to showcase the service and/or the possibilities of a *customer self-directed* application. Flash demos are used on the website.

Flash demo

Short form of a demonstration video created using Macromedia Flash software. The video can be viewed by website visitors using the free Macromedia Flash Player. Services requiring explanation can thus be conveyed more easily.

- Open-house events with talks by satisfied customers.
- Customer familiarization events where customers are able to gain an impression of the possibilities now open to them.

The navigation bar of America's largest franchise chain for graphic arts products, Sir Speedy, has been chosen to illustrate the structure of a website which attempts to marry the goals of winning new customers and retaining existing ones (cf. Figure 75).

The left-hand column and the "Product & Services" area are used primarily for winning new customers. "Products & Services" provides an overview of all the print media services that the company offers, complete with brief descriptions. "Sir Speedy" has a portfolio which extends from single copies to catalog printing. It has around 1,100 interfaced franchises which function as copy

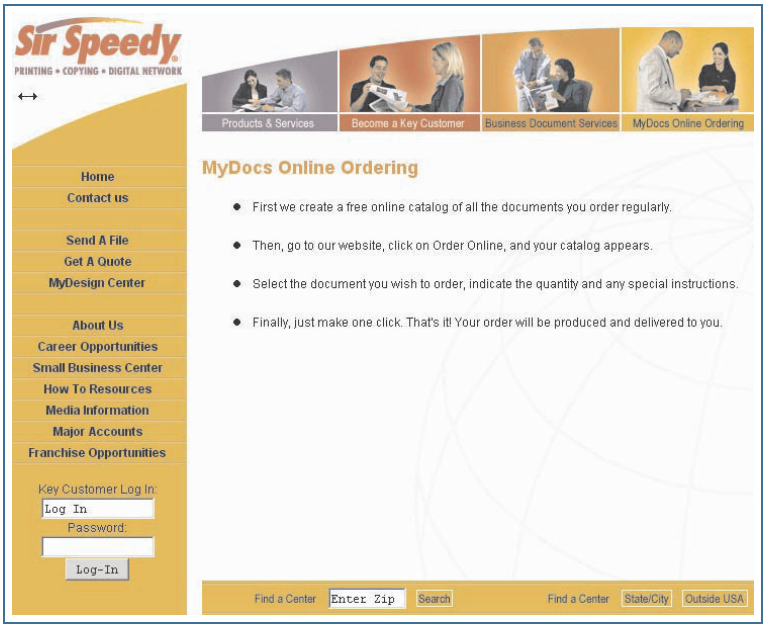


Figure 75
Example of a navigation bar. We have clicked on: "Become a Key Customer" – "MyCustom Catalog"
www.sirspeedy.com

shops at a local level, while also serving as reception points for complex print jobs that are then processed via interfaced offset printers – all of this geared to the overriding corporate goal of "providing all services in one location".

The second button "Become a key customer" and the direct login option at the bottom left show that Sir Speedy has plenty more to offer regular customers. Customers can gain an impression of what exactly this may be in one of two ways –

- From the description of the services they could receive as regular customers. By way of example, Figure 75 shows what happens when we click on "Become a Key Customer" and then, in the drop-down menu that then appears, we select "MyCustom Catalog". Here, under the heading "MyDocs Online Ordering", Sir Speedy describes its customizable online ordering system, which uses the basic principle outlined in Section 2.2.8 of this book.
- By offering simple services under the "MyDesign Center" button. Here, customers have the option of Web printing straightforward standard printed matter such as welcome cards and business cards, as described in Section 2.2.4. Although this is geared to private customers who can be expected to make up only a small percentage of total sales, offering this Web printing service shows that the company is at home with e-business.

4.1.1.2
E-marketing

Designing and constructing the website is one thing, making the website and website updates known to new and existing customers is another. This is done using both classical advertising measures and Internet-based – e-marketing – measures.

E-marketing
The term e-marketing covers all activities that use the Internet for advertising purposes.

This measures are listed below and a number of them are illustrated using examples.

- Entry into index-based search engines and/or catalogs
- Sponsored links in search engines (cf. Figure 76);
- Own newsletter mailing
- Advertisements in a newsletter relevant to the target group

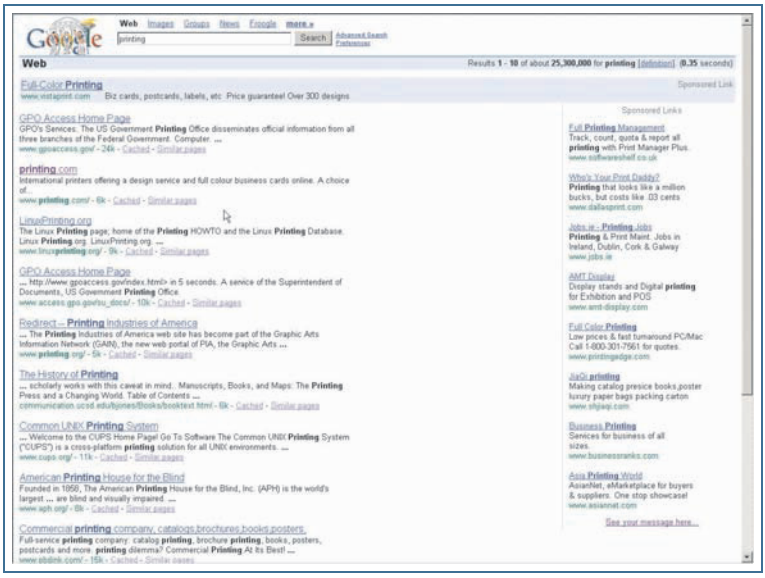


Figure 76
Example of sponsored links found using the search engine Google

4.1.2
Invitations to Bid – Addressing Customers Without Contacting Them

A growing number of orders are being awarded by public bodies using invitations to bid (also known as "invitations to tender" or "calls for proposals" in some parts of the world). Whereas these were previously announced in daily newspapers, official publications or trade journals – a procedure that required considerable research on the part of bidders, the Internet has today made access much easier. This is primarily the result of two key developments:

- The e-procurement activities of the authorities themselves designed to considerably simplify administrative procedures through greater use of the Internet and
- The creation of industry-specific brokering platforms.

Opinions as to whether it is worthwhile participating in public invitations to bid are still divided in the industry. While a number of print media service providers report that they generate up to 40% of their sales through invitations to bid, others state that they have discontinued this line of attack, as they have failed to win a single contract.

There are likely to be two main reasons for these quite different views:

- Firstly, not every company has the right production spectrum to generate quotations that come up with the lowest price – which is what invitations to bid are primarily designed to achieve.
- Secondly, it is vital to get to know "public service" customers, their rules and requirements in just the same way as it is industrial customers. This means being able to think your way into the mindset of the customer and his selection criteria and draw up a quote that meets his needs this is something that will probably not be possible without suitable training.

A good example of a comprehensive platform covering invitations to bid is Tenders Electronic Daily (TED), the eleven-language platform of the European Union. All invitations to bid above a threshold of 130,000 euros are published daily on this site. Figure 77 shows the search mask and Figure 78 an example of an inquiry. Access is free, but the process of familiarizing oneself with EU regulations – not just the vocabulary (cf. Figure 79) – is very learning-intensive.

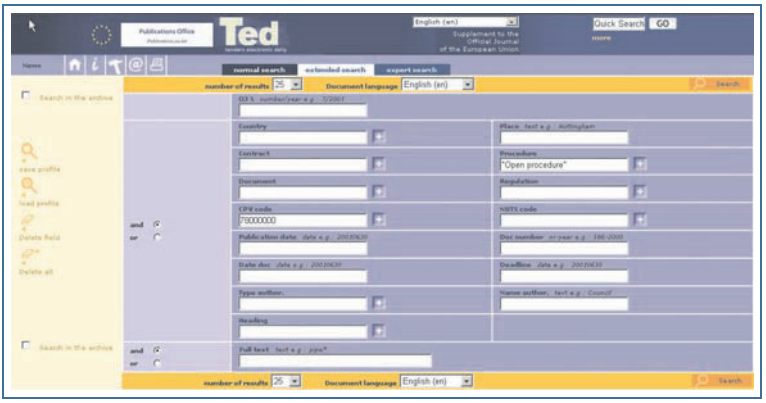


Figure 77
TED search mask
ted.publications.eu.int

Figure 78
Example of a TED bid announcement
ted.publications.eu.int

Figure 79
Extract from the Common Procurement Vocabulary (CPV) of the EU to facilitate the search for interesting invitations to bid
ted.publications.eu.int

4.1.3
Reverse Auctions – Printing at Any Price?

The procedure for public sector invitations to bid described in the previous chapter consists of interested bidders submitting written bids in sealed envelopes by a given closing date. These are checked, queries clarified where necessary and the contract finally awarded. No bidder ever discovers what his competitors bid.

The only difference between these public invitations to bid and other invitations lies in the fact that customers from private industry can explicitly request selected suppliers to enter a bid by

Figure 80
E-procurement platform of Siemens AG
www.click2procure.siemens.de/en/c2p/index.cfm

a specific point in time – and do not need to do so publicly in compliance with specific time schedules. Here, too, no bidder normally ever discovers what his competitors bid. Large customers are increasingly organizing procurement processes of this type via their own e-procurement platforms. Figure 80 shows the user interface of Siemens' global procurement platform.

The invitation and bidding processes can be handled electronically in this age of e-business – giving rise to what is known as e-bidding. If a print media company uses the customer's order management system to submit a structured quotation using the process described in Section 3.3.2, this is e-bidding. The only difference from the normal process of submitting quotations lies in the fact that the customer finds it easier to compare prices and can award the contract faster.

In the case of a "reverse auction", customers go one significant step further. The bidders can view their competitors' bids (though not their names) during an auction started by the potential customer at a specific point in time (cf. Figure 81).

To explain the principle involved in the "English" auction, the parties interested in a particular product being sold meet at a specific location where there are requested to submit their bids. Starting from a minimum bid, the bidders increase the price step-by-

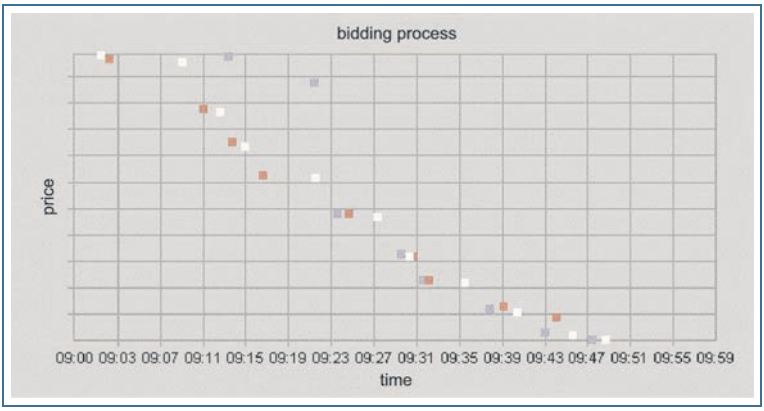


Figure 81
A bidding process for a 60 minute auction with three bidders (shown in different colors)
www.click2procure.de

step until the auctioneer sells the product in question to the last, i. e. highest, bidder. The online auction platform eBay uses the same principle.

A "Dutch auction" approaches things from the other angle. The auctioneer begins the auction with a high price and reduces it step by step until a bid is received. The person putting in this first bid – i. e. the lowest – wins the auction.

While the English and Dutch auctions require the potential buyer to submit bids, the reverse auction requires potential suppliers to submit bids. Consequently, the bidders underbid each other until the contract is awarded to the supplier making the lowest bid. As with a conventional auction, this takes place live "at a specific location" – in this case, using an online auction platform that all participants can access simultaneously.

Unlike eBay, reverse auctions between companies take place behind closed doors. The potential buyer uses special software to invite selected suppliers to participate in an auction. The auction rules can differ from one auction to the next. To prevent dumping bids that take no account of quality or health and safety, the contract can also be awarded, for example, to the party putting in the second-lowest bid.

Auctions of this type between business partners are already very popular in some industries. The invitation to bid and auction modules of Siemens' "click2procure" platform, for example, have been online since January 2001. Siemens' figures indicate that around 3,000 strategic buyers and 4,500 suppliers are already using the modules and that purchase contracts worth in excess of 2 billion euros have already been awarded. As well as such in-house software solutions, there are also businesses which offer online auctions as a service.

4.2 Procurement

The print media company is a supplier on the one hand, but is also a customer to its own suppliers on the other. This section will look at selected procurement processes used by print media companies that are being changed by the Internet.

A study conducted in Germany by the German Printing and Media Industries Federation found that there is significant potential for e-procurement among print media companies (cf. Table 4).

It also discovered that the primary barrier preventing the Internet being used more for procurement purposes lies in a lack of attractive offers. The supplier industry is breaking down this barrier step by step. Further improvements can be expected. The following examples of e-procurement processes for print media businesses can therefore only represent a snapshot in time.

Table 4 Assessing the benefits of e-procurement solutions (BVDM 2004)

	Answers as a % of all participants			
Points/features of an e-commerce solution	very important	important	less important	not important
Information on prices	47.5	32.6	12.7	5.0
Information on availability	48.1	33.7	11.6	2.2
Information on delivery dates	45.3	30.9	13.8	5.0
24-hour access	30.4	27.6	26.5	11.0
Quotation processing	16.6	43.1	25.4	8.3
Electronic order placement	23.8	34.3	26.5	9.9
Reduced ordering input	28.2	39.2	18.8	7.7
Shorter processing time	29.3	38.7	21.0	6.6
Automatic order confirmation	16.6	34.3	30.9	12.2
Shorter delivery times	18.8	37.0	29.3	7.2
Tracking of order status	14.9	34.8	30.9	12.2
Electronic billing	5.0	23.8	34.3	31.5
Order overview	9.4	37.6	31.5	16.0
Electronic payments	12.2	25.4	34.3	21.5
Access to own terms & conditions	11.0	32.0	32.6	17.1
Information on special offers	22.1	40.3	24.3	6.6
Information on new products	24.9	45.3	21.5	3.3
Opening up new purchasing channels	18.2	48.1	21.0	6.6

4.2.1
Buying Paper

There are two e-business strategies that need to be distinguished when buying paper online:

- The simplified ordering and processing procedures at the particular wholesaler himself. This option is illustrated using the example of e-commerce tools from the UK-based Robert Horne Paper Company.
- Purchasing stock, residual-stock and special items via market places. This option is illustrated using the example of CN Papiervertriebs GmbH in Germany, which also enables buyers to group together their paper purchases.

4.2.1.1
The Electronic Supply Process with PapierLinx. – Customized Prices, Availability and Delivery Dates at a Click

Paper wholesaler The Robert Horne Paper Co. in the UK is the largest subsidiary of PaperLinx, an Australian company with global operations. PaperLinx started e-commerce in 2000. It developed a central system for powering the webshops of its European operating companies. Each of these companies has given its website its own look and feel and offers its own product catalogs to its customers.

PaperLinx reports increasing acceptance levels with printshops. This is due primarily to the direct link to the internal ERP system. Registered customers can now gain 24×7 access to all the information that PaperLinx staff have on their own system and which previously had to be conveyed to the buyer by phone. They can then place orders directly. This means that, even after the dealer or his branch has closed down for the day, the customer can still check whether the paper he requires is available and can be supplied the next day. He can then place the order straight away if he chooses.

After logging in, the buyer can search through the entire product range and submit orders using the usual shopping cart functions. Templates make it easy to place repeat orders. During the ordering process, the paper buyer can check

- the customized price and ensure it is correct, e. g. based on negotiated 100 kg prices for specific lots and grades or tiered prices;
- availability and
- delivery date.

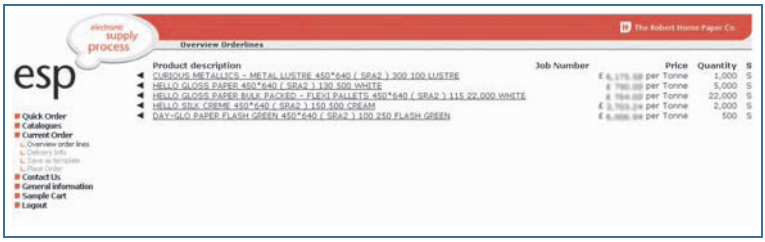


Figure 82
E-Commerce application of The Robert Horne Paper Co. In this case, view of orders in progress www.esp-roberthornepaper.co.uk

Figure 83
E-Commerce application of The Robert Horne Paper Co. In this case, shopping cart module and price overview www.esp-roberthornepaper.co.uk

An order management module also makes the buyer's work easier by maintaining records of all previous orders. This allows the buyer to check the status of all orders at any time. This function is shown in the left-hand frame of Figure 82.

Figure 83 shows such an extract from an ordering procedure. The left-hand frame shows the product directory. In the middle are the product details and the customized price information (these have been blurred out for data protection reasons). At the bottom you can see the current content of the shopping cart.

4.2.1.2 Market Place for Paper Procurement – Illustrated by CN Papiervertriebs GmbH

The dot.com boom gave rise to online paper exchanges which enabled stocks of unwanted residual paper that were simply tying up capital to be sold to the highest bidder via an Internet platform.

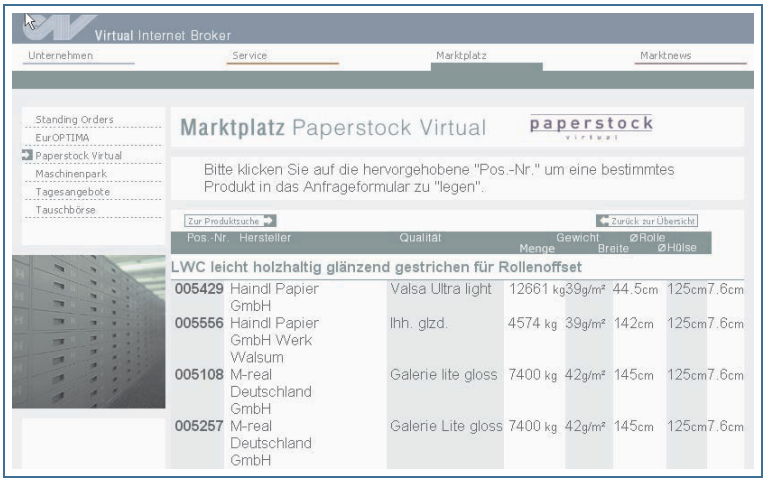


Figure 84
Extract from the on-line paper exchange CN Papiervertriebs GmbH
www.cn-paper.de

The idea itself sounds great, but it didn't catch on. One of the main reasons was that, before the first sales commission could be earned, a great deal of money had to be invested to develop the software and publicize the portal. After all, the first orders could only be generated once the platform had a critical mass of suppliers and buyers. The logistics were a second problem. Transporting a ream of paper from Hamburg to Munich was naturally not a viable proposition and the transaction had to be completed within only a few days. Another problem was the fact that buyers were unsure about the quality of the goods being auctioned, while vendors for their part were unwilling to divulge their names. This is perhaps not surprising, since no company likes to admit that it has bought in too much paper!

As a result, many market places have simply disappeared, while others have become more specialized. CN Papiervertriebs GmbH in Weilerswist near Bonn, for example, has developed an online market place which runs alongside its core business and is building this up gradually using its existing contacts and transport logistics.

Figure 84 shows a section from the stock of reel paper being sold. In addition to this "Paperstock Virtual" the company also provides a "Standing Order" link for selling paper whose web width can still be customized at the factory.

The "EuroOptima" link provides a means for bundling together purchases of paper from different reel-based printshops in order to broker better terms from manufacturers. The idea of such purchasing cooperatives is not new, but the possibilities now opened up by the Internet with automated coordination processes and part-

ner companies identifying their needs online does perhaps signal a new level of dynamism for the future.

4.2.2 Inks – Illustrated by BASF Drucksysteme

The benefits that e-business can bring an ink manufacturer are demonstrated by the example of the e-shop operated by BASF Drucksysteme GmbH. Like the SchneiderSöhne paper ordering facility, the BASF e-shop is linked to a merchandise information system. Three features that can facilitate daily routines should be highlighted here.

- Price and availability checks. If articles are not available immediately or if the price of an article has not yet been agreed with the customer, this is indicated in a window (cf. Figure 85). In these situations, the delivery dates or prices for the articles in question are phoned through later by the sales staff.
- Orders already awarded can be viewed and their status tracked (order tracking, cf. Figure 86). Three statuses are possible: order set up, goods partially removed from warehouse, all goods removed from warehouse. This function can be particularly interesting if ink buying is decentralized and could possibly result in orders being duplicated.

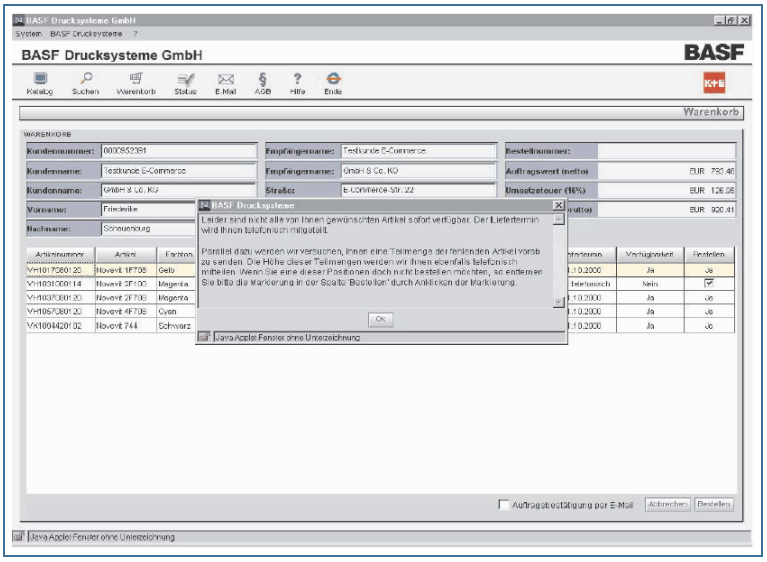


Figure 85 BASF e-commerce system. In this case, price and availability checks www.basf-drucksysteme.de

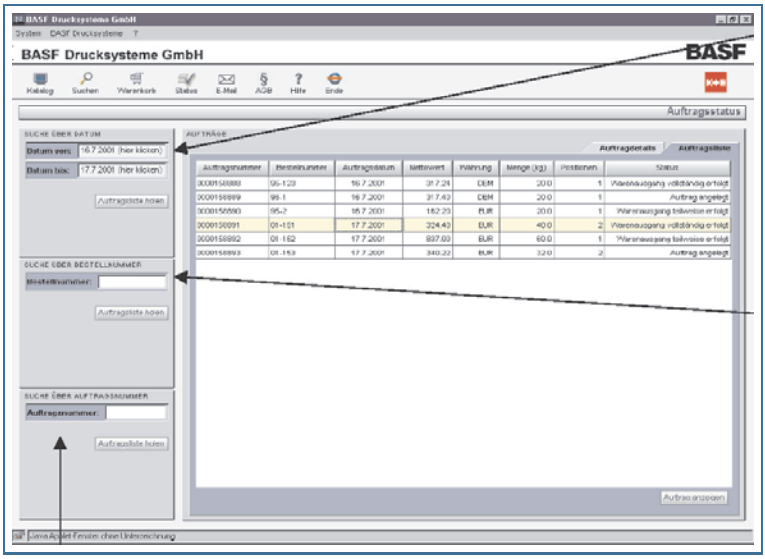


Figure 86
BASF e-commerce system. In this case, order tracking www.basf-drucksysteme.de

- Ordering is also facilitated by the possibility of generating order templates. If a similar order needs to be awarded, the contents of old shopping carts can be accessed, adapted as necessary and submitted as a new order.

4.2.3 Image, Text, Graphics etc.

If a printshop opts for a particular paper or ink dealer, then it will almost certainly not do so just because the dealer can boast an exceptional e-business application. A much more important factor when buying inks is rapid availability – in other words that the dealer has excellent warehousing and transport logistics in place.

This does not apply to dealers in digital products such as images, fonts, software, film, audio material, graphics or text modules. In these market segments, online sales have developed into the primary sales channel over recent years, since the digital products can be supplied online to customers immediately after ordering. Separate transport logistics are not required. Online payment systems have become a matter of course. The primary differences among suppliers of digital products is to be found in the quality and scope of their portfolios and in the search functions they support. There is also an ever-increasing supply of tools for layout personnel, for example, which make selection easier.

Figure 87
Homepage of
www.gettyimages.com

An excellent example of the search options and tools available today for buying images and graphics is the US photo agency Getty Images, which has branches in various countries (cf. homepage in Figure 87).

The "Creative" link connects to one of the world's leading catalogs for license-free and licensed images which can be displayed for selection and purchase using a keyword search facility.

Let's look at how a layout designer finds a suitable design element:

Imagine he has to find a photo that illustrates group learning using state-of-the-art techniques and is suitable for a flyer publicizing a college course. He searches for the keywords "discussion" and "laptop". This returns 328 hits. In one respect, the layout designer is happy with this, since the choice is so huge that there is relatively little risk of a competing college already using the same image. But the result also shows the dilemma of the Internet – the choice is so vast that it can be overwhelming. Spending a day searching for the right image is hardly justified when designing a flyer. So the search has to be narrowed down a bit further.

Additional keywords can be entered to reduce the number of hits or either monochrome or color images can be excluded. In this instance, the choice is further restricted to "women" and "multicultural" to get a mixed group. The remaining 93 options can then be considered and a decision made faster.

Layout designers don't normally choose images on their own. Getty Images is continually expanding its e-commerce portfolio for professional users. Before submitting an order, for example, the layout designer can create a light box. In this instance, it has been

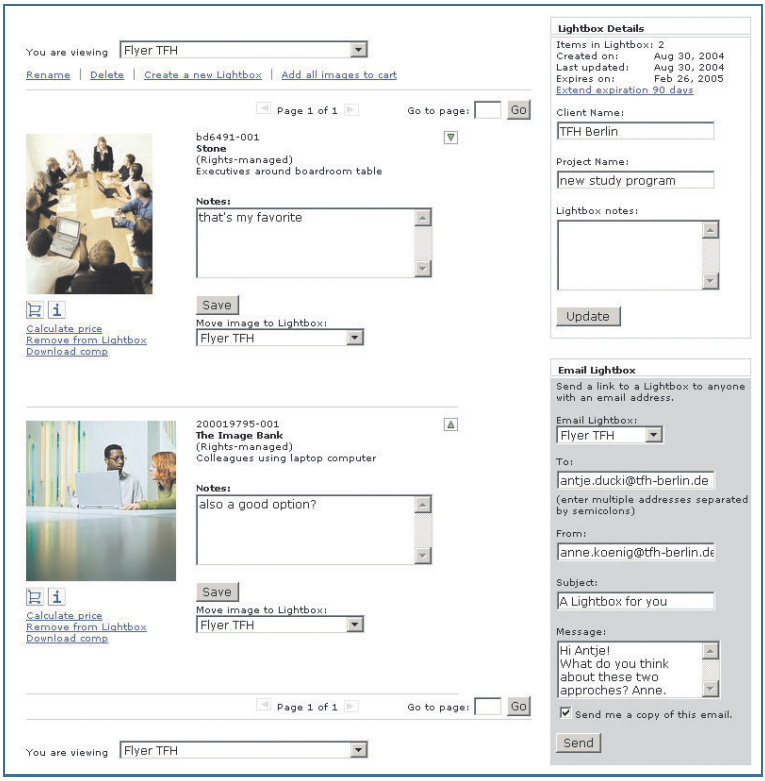


Figure 88
The light box function used by Getty Images provides a useful tool for working with customers and/or production partners
www.gettyimages.com

given the project name "Flyer TFH" (cf. Figure 88). All shortlisted photos are loaded into the light box, comments added and the link e-mailed to other persons involved in the decision-making process, in this case a colleague called Antje.

As with all e-commerce services, the user must first register if he wishes to make a purchase. A calculation module then appears which asks questions to determine the licensing fees involved – for example, the duration of use, the distribution area, the type of use and the industry. Figure 89 shows one possible result for use in a flyer with a circulation of 5,000 copies for the education sector. Following payment of 595 euros by credit card, an invoice is dispatched online and the image supplied in high-resolution JPEG format. The complex calculation process, which requires around eight clicks, can be saved as a template. Like the light box, this provides another small but useful tool for increasing efficiency in the design process.

Search systems and support functions need to satisfy other requirements when it comes to fonts. The Linotype Library, for ex-

Figure 89
Result of the license fee calculation for a selected image from Getty Images

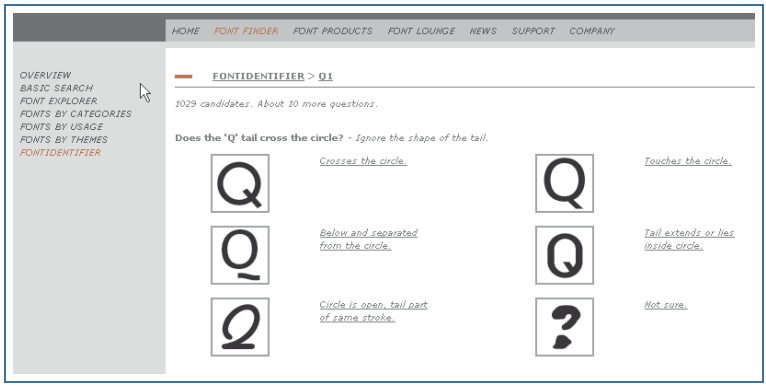


Figure 90
Extract from the "Fontidentifier" function of Linotype Library
www.fontexplorer.com

ample, supports the usual search functions for font names plus a structured search for fonts which the user has seen but can't identify by name. Figure 90 shows the first set of questions used by the "Fontidentifier" which has been developed specifically for this purpose.

4.2.4 Production Partners – How to Find New Suppliers and Freelancers

In the graphic arts industry, a full-service provider often needs to find production partners to help him process orders within budget,

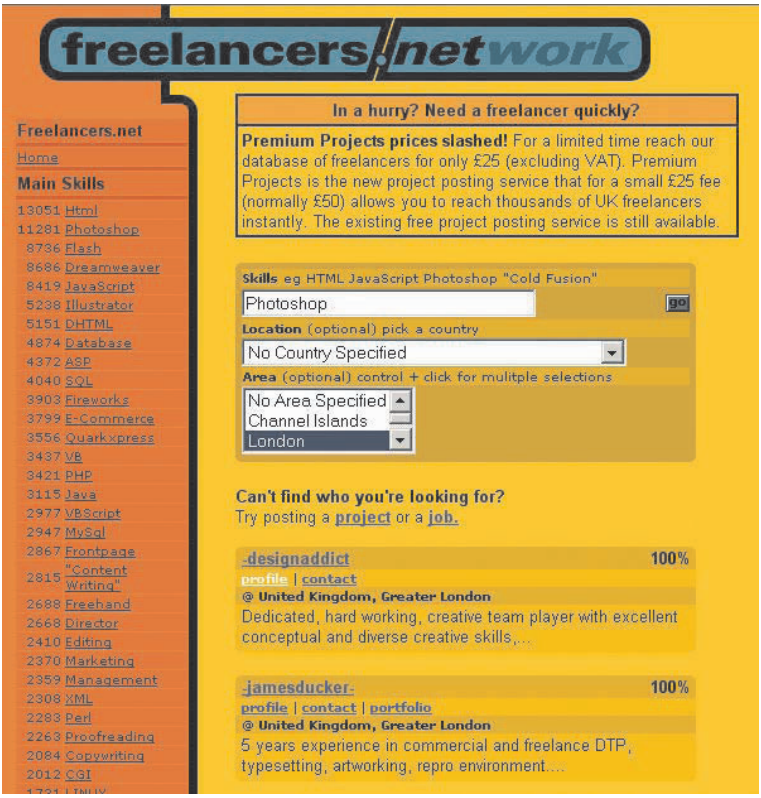


Figure 91
List of qualifications and extract of search results from freelancer forum www.freelancer.net

on schedule and in the required quality. While customers know their coating and finishing partners personally and this inevitably limits the choice of suppliers to those located nearby, it makes sense with design and software development orders to find freelance staff who are able and willing to work on a fee basis. These can be found on the Internet through "freelancer forums". These online market places are populated by suitably qualified design professionals who are capable of supplying details of reference projects.

Figure 91 shows as an example the areas of activity of freelancers looking for work on the "freelancers.network" online market place. To raise customer confidence in the freelancers' qualifications and abilities, a comprehensive quality assurance system has been introduced by some market place providers. This allows potential customers to view not only the freelancer's profile but also ratings provided by previous customers.

5 Conclusion

Marketing, production, procurement – in all production phases, the Internet offers companies new ways of cooperating with customers, production partners and, not least of all, their own staff, who no longer need to come into the production rooms each day, but can handle some elements of their work just as effectively from home or remote offices. We already take the Internet for granted as an information and communication medium. In the future, it will be networked to such a degree that it will extend into the production processes of the individual partners. This will deliver greater success for companies who

- have networked their in-house processes;
- have ensured that individual areas of this network can be opened up step by step for selected customers, and
- see themselves as partners to the customer and utilize all opportunities to make the processes as easy as possible for the customer.

This networking clarifies the division of labor between the various production partners. The core competence of the print media companies lies in designing and producing communication media, while that of the publishing houses, agencies, industrial enterprises and service companies lies in optimizing their products and services for their customers.

Given the dynamic nature of this medium, harnessing the diversity of networked opportunities without jumping on every bandwagon will remain a key challenge in the future. We hope that this publication will provide you with inspiration in selecting the best opportunities and acting on them.

6 Glossary

Advertising materials ordering system → Corporate design portal

Asset In e-business the word "asset" represents elements of the company's wealth that increase in value through their repeated use. An asset, for example an image or text module, consists of several components – the actual content, the related metadata and access rights.

Book on Demand The term Book on Demand is a subset of ⇒ Print on Demand (PoD) and is used for the production of books which are printed in small quantities only after they have been sold. No storage is therefore required.

Business management workflow Automation of data transfer to upstream and downstream software systems providing commercial and organizational support to the production process. In particular, this includes quotation and ordering systems, costing, billing and material management. *Common synonyms: Commercial workflow; management workflow, business workflow. Counterpart: ⇒ Technical workflow*

CIP4 The body coordinating the manufacturers in the CIP4 consortium (International Cooperation for the Integration of Processes in Prepress, Press and Postpress), which represents over 100 software and hardware suppliers in the print media industry under the auspices of the Fraunhofer-Institut für Graphische Datenverarbeitung (IGD, Fraunhofer Institute for Computer Graphics) in Darmstadt. *Contact: www.cip4.org*

Click stream Term from analysis of website user behavior. A click stream shows the sequence of page impressions of a Web browser over a certain period of time.

Color management Color management is the term used for controlling color reproduction in a digital graphic arts production process. The various input and output devices ranging from

scanners to printing presses use different color spaces depending on the particular device. To standardize color reproduction beyond the confines of the production process, color profiles are generated for the devices and processes involved. The coefficients required for the conversion are calculated from the color profile linkup. Colors from one color space that cannot be represented in another color space are approximated as far as possible.

Computer Integrated Manufacturing (CIM) The term CIM covers all activities for transferring data from an upstream process to a downstream one and thereby achieve automation. In contrast to technical automation, it is not the machines that are interlinked, but rather the data flows. Standard data formats must be developed and employed to ensure that this functions smoothly across different manufacturers.

Content billing system A content billing system provides a simple means for billing the use of content. The systems generally support different billing systems, for example subscriptions of limited duration or payment per accessed file, possibly dependent on data volume.

Content Content refers to all text, image, audio and film materials used on a website or in a print publication.

Content Management System (CMS) A CMS system is a software package that enables multiple authors to change content without having to have any knowledge of programming websites. Layout templates are provided for this purpose and a user management facility enables several persons to access the same website with ease.

Corporate design portal Internet-based software solutions that provide different departments, branches or offices of a company with structured access to data for accessing or generating print media and online media.

Cross-media publishing → Database publishing

Cross-media When a company uses different media to convey the same content, this is referred to as "cross-media". Cross-media is an important consideration when devising multi-media advertising campaigns and researching into their impact, but it also involves technical aspects when the same data needs to be used for different output media.

Cross-selling Cross-selling endeavors to sell buyers additional content-related products in addition to the original product or service. A tour organizer selling holdalls is a good example of this.

Customer Relationship Management (CRM) Customer Relationship Management is a strategic concept designed to systematically locate the customers that are important for the company in question in order to provide appropriate marketing, sales and service offerings that are tailored to the various customer segments. One consequence of this strategy for the print media industry is greater → personalization, → versioning and → customizing of media products.

Customer The term customer is used to designate all clients of a print media service provider. Customers are very frequently also ⇒ production partners.

Customizing Customizing adapts the content to specific customer groups, e. g. industries.

Database publishing Generic term for all applications where parts of the production process for print media products are automated through the use of databases.

Digital Asset Management system → Media Asset Management system (MAM).

Digital job ticket Functions of industry-specific ERP software in print media companies where information accompanying the order, e. g. details of the format or print run, can be accessed via the screens of the various workstations.

Digital signature Like a signature in the paper-based world, a digital signature is used for electronic messages to document their authenticity (origin) and integrity.

E-bidding Electronic submission of bids using special order management software.

E-book The term e-book (electronic book) is used to designate both the hardware used for reading electronic books (e. g. Rocket eBook) and the software.

E-commerce system Software that supports the sale and purchase processes. They include in particular catalog integration, generation of a shopping cart and support for the billing process using e. g. credit cards.

E-marketing The term e-marketing covers all activities that use the Internet or e-mails for advertising purposes.

Enterprise Resources Planning (ERP) system ERP system is the generic term for all software solutions that support the quotation, order, production planning, materials management, logistics and billing processes. Major suppliers of ERP systems include SAP and Microsoft Navision. There are very many ERP system suppliers in the print media industry. This software's key strength lies in its quotation and actual-costing functions. It is known as "industry-specific software", "order management software" or "management information system (MIS)".

EUPRIMA (European Print Management System Association) Founded in 2000, this association is committed to bringing together print-specific business management expertise. Its work is currently focused on integration of the ⇒ business management workflow using ⇒ JDF. *Contact: http://www.euprima.org.*

Hard proof Proof printed out on special material or paper. The term was introduced to distinguish it from soft proof – the screen output of a print job for approval purposes.

Hyperlink Hyperlinks are colored text or graphics elements in an HTML document. Clicking this link guides the reader to a file on the same or a remote computer. Using hyperlinks to network information lies at the very core of the World Wide Web (WWW).

ICC profile An ICC profile is a file which is compatible with the →ICC standard and which describes the color reproduction of an input or output device and color spaces.

IFRA The IFRA is headquartered in Darmstadt and is a leading international organization of newspaper publishers. *Contact: http://www.ifra.com*

Industry-specific software ⇒ Enterprise Resources Planning System (ERP system).

Innovation Innovations are all products and processes introduced by a company that result in considerable changes to the previous mode of operation. This is in contrast to smaller improvements and adaptations. A distinction is made between ⇒ product innovations and ⇒ process innovations.

International Color Consortium (ICC) The ICC provides a forum where leading manufacturers of prepress products come together to promote color management, in other words device-independent processing of color representations. *Contact: http://www.color.org*

IRD (Institut für rationale Betriebsführung in der Druckindustrie) Business management advisory institute for the print media industry. *Contact: http://www.ird-online.de*

JDF (Job Definition Format) JDF is a standard introduced by the → CIP4 consortium for facilitating the exchange of information between application programs and systems in the print industry. JDF is based on and augments existing solutions such as the Print Production Format (PPF) from CIP3, the Portable Job Ticket Format (PJTF) from Adobe Systems and IFRAtrack. JDF supports the integration of business management applications and the technical workflow.

Knowledge management The term "knowledge management" covers all specific activities by a company to communicate the internal know-how of its staff so that everyone can access this whenever they require information. In the simplest of cases, knowledge management may simply consist of regular discussions in small companies and drawing up standard procedural instructions. The bigger the company, the greater the amount of communication required to manage the internal knowledge. A CMS used to provide technical support on the intranet is an important element in achieving knowledge management in practice.

Log file File on a Web server which logs and saves details of all access to the website.

Machine data collection Capture of production data directly from the control systems of the particular machine, e. g. a printing press. The data, e. g. the current press speed or the number of prints made at a particular time, is used for production control purposes, actual costing and the like.

Management Information System (MIS) ⇒ Enterprise Resources Planning system (ERP system).

Media Asset Management (MAM) system Database for managing large stocks of media data such as images, graphics, video, audio and text in different data formats, complete with their ⇒ metadata.

Metadata Metadata is all information relating to content which adds detail to the latter and makes it easier to find.

Open-source software Open-source software is a program source code available to everyone free of charge on the Internet. This means that it can be improved by anyone with programming

skills and can be rewritten, used, copied, passed on and posted back on the Internet at will. The most popular open-source software products among users include the "Mozilla" browser, the "Linux" operating system and the "Apache" Web server. Open-source software should not be confused with freeware (free software), however. Freeware is software that incurs no charge. The question of whether it can be changed, copied or passed on to others depends on the particular license conditions.

Operating data collection Input of data for actual costing directly at the workstation in order to avoid manual entry using daily dockets. This process can be partially automated using ⇒ machine data collection, since data from the production machine (e. g. the number of prints made) can be adopted directly. *Common synonym: Digital daily docket*

Operator model Operation of a production system in-house and on behalf of the customer.

Order management system ⇒ Enterprise Resources Planning System (ERP system).

PDA (Personal Digital Assistant) A PDA is a small notepad-style portable computer. PDAs generally consist of a display that takes up most of the unit's surface area. Data, in particular addresses, diary entries and notes, is written directly onto the pressure-sensitive display with a special pen and is interpreted using handwriting recognition software.

PDF (Portable Document Format) File format developed by Adobe Systems in which text, graphic and image information is combined on an application-neutral basis in a standardized document. PDF documents can be exchanged easily between different software platforms.

Personalization When using personalization the parts of the content relating to the addressee are changed within the overall run to effectively generate a "run of 1" for each specific addressee.

PJTF (Portable Job Ticket Format) File format from Adobe Systems which, unlike ⇒ PDF, contains no content, merely metadata about the content in the form of a "Job Ticket" attached to the data. The PJTF is integrated in the ⇒ JDF.

Portable Job Ticket Format (PPT) File format from the predecessor of the ⇒ CIP4 consortium. There is a tendency to move from PPF ⇒ to JDF.

Portal Generic term for all websites which bring together several suppliers and/or combine several applications.

Printing-on-demand (PoD) Production of printed matter at the precise time and in the precise quantity required. No storage is therefore required.

Process innovation All ⇒ innovations where the company introduces significant changes to the form of the internal and/or cross-company production or organizational processes. Example: The introduction of computer-to-plate in a printshop constitutes a process innovation. Counterpart: Product innovation.

Product innovation All ⇒ innovations where a company introduces new products or services to the market with a view to generating new sales. Example: The purchase of a digital press with personalized print options constitutes a product innovation. Counterpart: Process innovation.

Production partners All partners involved in a production process. Unlike ⇒ suppliers, the need for cooperation between production partners extends well beyond a defined ordering process.

Reverse auction Internet-based live auction which is initiated by the customer using special software and where bids by the suppliers are also visible to other bidders.

SGML (Standard Generalized Markup Language) SGML was approved as an international standard for defining markup languages in 1986. This technology is based primarily on the consistent separation of the document content, the structure of the document and the display of the document. The standard language for describing pages on the World Wide Web, HTML, was developed on the basis of SGML. The extent of the SGML language definition (over 500 pages) and the high level of programming this calls for when other programs need to create SGML-compliant interfaces were the primary reasons for creating → XML, a "lite" version of SGML.

Soft proof Output of a print-ready page for checking on the screen. To avoid confusion, the term "hard proof" was introduced to represent a proof printed on paper or special material.

Supplier Unlike ⇒ production partners, suppliers have a clear interface to the company, e. g. via a simple ordering procedure (purchase of digital images on the Internet). Depending on the

company and order structure, suppliers may be regarded as production partners and thereby form part of a closely-networked collaboration arrangement.

Technical workflow Automation of the data transfer process and data processing in upstream and downstream software systems. Unlike the → business management workflow, this data is the actual print data, i. e. the printing form or page to be printed. *Common synonym: Production workflow. Counterpart: → Business management workflow*

Versioning Versioning adapts the content to a specific target group in order, for example, to produce different regional and language versions of one and the same brochure.

W3C (World Wide Web Consortium) W3C is an association of various institutions founded in October 1994 for developing the World Wide Web, for example by passing standards for data transfer protocols. The consortium is led by Tim Berners-Lee, one of the originators of the World Wide Web, and chairman Jean-François Abramatic. *Contact: http://www.w3c.org*

WCMS (Web Content Management System) → Content Management System (CMS)

Web editing Designation for applications used to modify texts via the Internet and enabling the effects on the layout to be verified directly as a soft proof.

Web printing Designation for applications that enable the customer to construct the digital print file himself and approve this for print.

Web2Print → Web printing

Workflow A workflow is generally understood as a procedure for the computer-based organization of work sequences. Data is moved automatically from one defined work stage to the next.

XML (Extensible Markup Language) XML is a subset of → SGML and was developed to enable the creation of easily programmed standard interfaces for various technical and business management software systems. → JDF is based on XML.

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