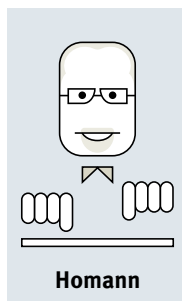


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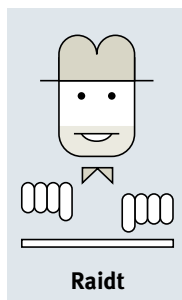
The production team

The close integration of text, translation and graphics in this book called for an equally close collaboration between the author, translator and designer. Only through intensive teamwork, from conception to production, has this book, in its present form, been possible.



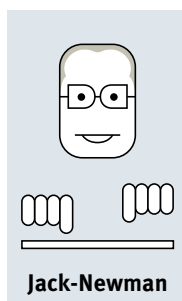
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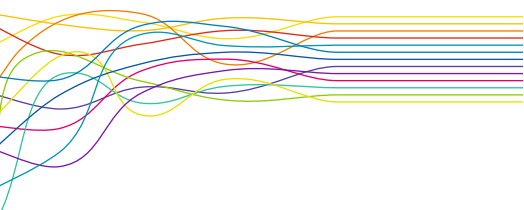
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Digital Color Management

**Principles and Strategies for the
Standardized Print Production**

 Springer



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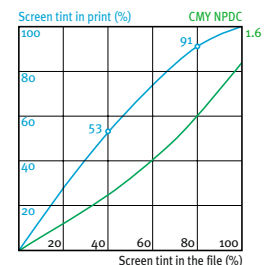
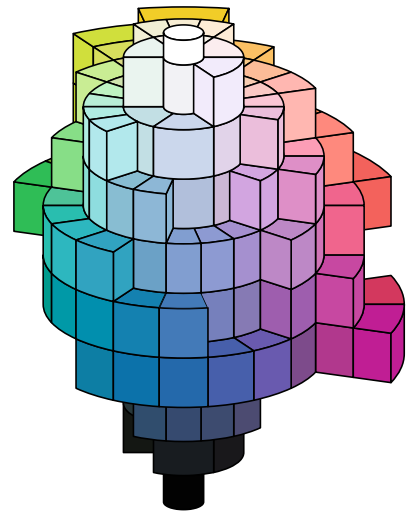
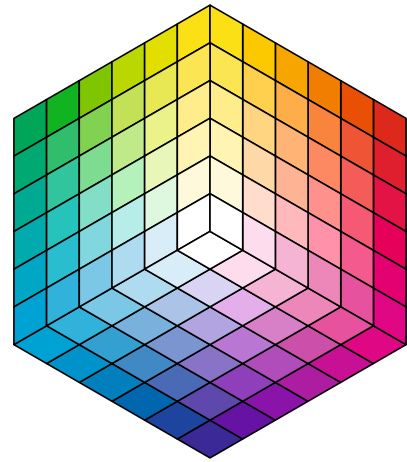
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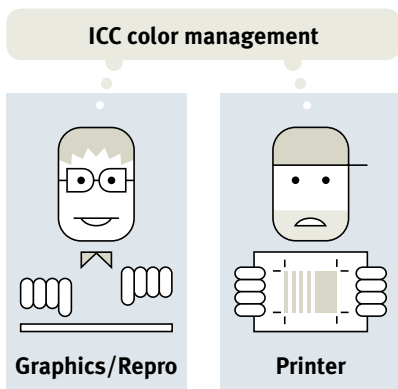
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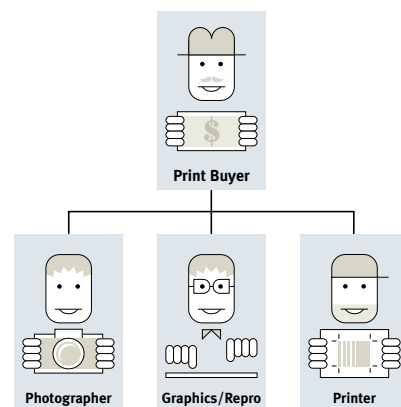
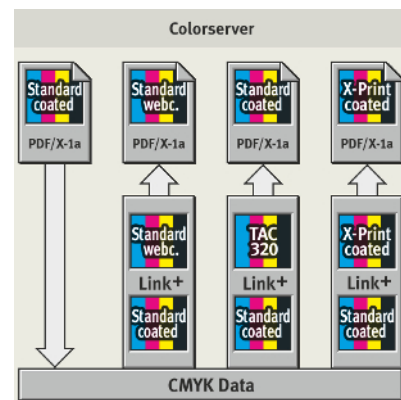


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1998: Introduction from the first German Edition

A Look Back at PostScript and a Look at Color Management

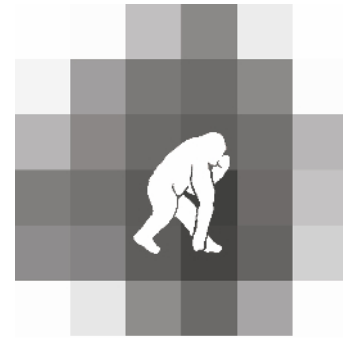
At first sight it might astonish some readers to begin a book concerning the handling of color with a look back at PostScript. There are many indications though that the technology known as “color management” will have as strong an impact on the organization of work in the graphics industry as PostScript has in the last ten to twelve years.

PostScript is a technology for running output devices and a universal exchange format for text, image and graphic files. Following the introduction of PostScript it was a few years until so-called Desktop Publishing Software made full use of PostScript’s possibilities. In this time PostScript was improved in certain areas to make it more practical. After this start, with all its teething troubles, the work organization in the graphic industry began to change radically. However, even twelve years after its introduction, many people who work with PostScript have still not grasped its concept. Whoever has worked in an imaging studio can sing a song about this.

After PostScript, color management is the second wave to break over the graphics industry. The PostScript wave has had a strong impact on two areas of the graphics industry in particular: creation (agencies and publishers) and production (classic photosetting and to an extent repro). The color-management wave clearly covers more areas: along with agencies, publishers and photoset, the repro area will change more drastically than with the introduction of PostScript. In addition to creation and production comes duplication. This is traditional and digital print. Also, photographers will have to rethink their ideas as in the long run color management is a technology for the exchange of digital images between all digital media.

The History of PostScript

PostScript is founded on basic elements that existed before its conception: the depiction of graphics and type by means of vectors as well as the depiction of images and photos by means of pixels. This encoding of text, graphics and imagery existed before the time of PostScript e.g. in some very expensive photosetting and prepress systems. The developers of these photosetting systems were responsible for everything, from the basis software for making text, graphics and imagery available on the computer, to the user software for the design work, to running the imagesetter. Each manufacturer had his own data format and was pleased when he could sell a few thousands of his systems worldwide. As a result, these systems, the peripherals and the software were expensive. In the early 1980s a photosetting work station with a basic furnishing of 100 fonts would have cost \$75,000. With PostScript came the crucial turning point.





The basis technology for the depiction of text, graphics and imagery became an integral part of the operating systems for personal computers. Likewise, the control of output devices became standardized along with the exchange of text, graphics and imagery between various applications.

The quality of the basis technology was in keeping with classic photosetting. The first applications based on this, however, had a different aim: instead of highly complicated and specialized photosetting software for a tiny specialized target group, PostScript-based software products were developed for the mass market.

“What you see is what you get” was the slogan at the time. Instead of programming language as with photosetting, the user could lay out his text, graphics and imagery directly on screen. The typographical possibilities were very limited to begin with, but the cost of the work place was only 1/10 to 1/5 that of photosetting. Whoever, as designer, used the machines from the DTP stoneage to the full, could produce simple yet appealingly designed printed matter.

In the realms of software development a completely different picture in comparison to photosetting revealed itself. A young company with a good idea for a clever application software had a better starting point by far than in the classic photosetting area: a much broader market and much lower development costs. The basis technology for the depiction of text, graphics and imagery as well as the control of output devices already existed on the machines of potential customers.

The first DTP software PageMaker 1.0 lacked, for example, the exact numerical access to important layout parameters such as type size, leading, image size and placement, etc. For experienced photosetters PageMaker was wholly out of the question. One year later a group of motivated software developers brought out QuarkXPress 1.0. With this, exact numerical working was possible. Within only a few years the division of labor within the graphic industry began to fundamentally shift. Innovative advertising agencies and publishers who until now had their jobs set externally, bought themselves a Macintosh and QuarkXPress and began to get into production themselves. Photosetting businesses that soon recognized the market trend also acquired DTP equipment and the necessary imagesetter. Not only were their own creations put out on the imager, but they also sold the imaging of PostScript data as a service to advertising agencies and publishers who had no imagesetter of their own.

This restructuring of work divisions was not without its problems though. The traditional ways of working between the designers (agencies and publishers) and the producers (photosetting) were long in place with few uncertainties.

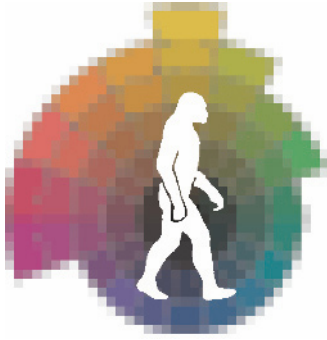
In the early years PostScript-orientated work organization was a real adventure for pioneers: the wrong type on the film, rough pixelated graphics, files that could not be imaged, and, and, and ...

Together, the pioneers among the designers and PostScript service providers learned to master the technology. The experience gained during these pioneering years allow these services to fulfil their complex contracts far more effectively and safer than any competition that has turned to this technology at a later date.



The development can be summarized as follows:

1. Special technology becomes part of the operating system.
(Photosetting technology moves to PostScript.)
2. Innovative software companies develop new, efficient and affordable products (DTP software is inconceivable without PostScript).
3. The designers to an extent become producers.
(Agencies and publishers set smaller jobs themselves rather than contracting a photosetting service.)
4. The old producers extend their services to offer new ones to designers. Although the producers (photosetting services) lose some of the contracts from their customers, they can build on new areas of business, provided they invest in the right technology in time (PostScript imagesetter).
5. The new technology and ways of working are, at the beginning, not without teething troubles.
This phase continues a few years after the introduction of PostScript. The teething troubles were down to the technology as well as the work organization of all involved with dealing with the technology.
6. The restructuring of workflow organization lasts longer than the initial technical problems.
Even after the basis technology of PostScript and the DTP software based on it was technically stable, it took a lot longer until those involved could work correctly with it. Many users and service providers today still have not mastered this technology within workflow organization.
7. The pioneers create their own market.
The pioneers of the early years develop a work organization to suit PostScript. Consequently they are able to work more efficiently, safer and can take on more complex jobs.



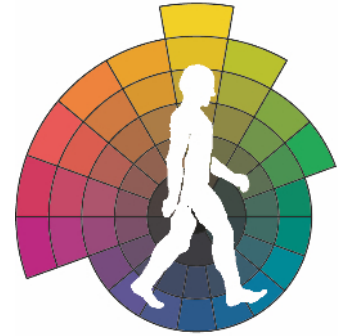
Parallels and Differences Between the Introduction of PostScript and the Introduction of Color Management

1. Special technology becomes a part of the operating system.
Also, the basis technology color management is already an integral part of specialized high-end systems. Whether it be the color processor in a drum-scanner or the color adjustment in a digital proof system.
2. Innovative software companies are developing new, effective and affordable products.
This phase is just beginning. Compared with the introduction of PostScript, color-management products are at the level of PageMaker 1.0. It is worth while then to watch the effectiveness of new software that touches on color-management technology.
3. The designers, to an extent, become producers.
This development begins with flatbed scanners that, with integrated color management and an automatic image analysis, offer even the beginner an increased quality in the face of an uncalibrated system.
4. The old producers extend their services to offer new ones to designers.
In comparison to the introduction of PostScript, this process is running much more smoothly. Alongside the introduction of color-management technology, PostScript is developing further and alternative output devices such as digital printing systems, slide imaging, CD-ROM, digital video production or internet are becoming important. Color-management technology serves as a base technology to ensure a consistency in color when transferring between these media.
5. The new technology and ways of working are, at the beginning, not without teething troubles.
This is unfortunately more the case than with the introduction of PostScript. Color management develops parallel to PostScript-based systems and creates one of many interfaces to other digital media. So not only are there the internal teething troubles of color-management technology, but also the problems that occur when integrating color management into other technologies.
For example, there is at present a number of areas of application where PostScript and color management conflict with each other, although each technology functions correctly in itself.
6. The restructuring of the work organization lasts longer than technical teething troubles.
As mentioned in the previous section, color management is a basis technology among others, which all grow together in digital media technology. So the demands on individual services and their workers will constantly change. One central theme for innovative services will be the development of tools and workflows for the assurance of quality.

7. Pioneers create their own market advantages.

The introduction of color management provides on the one hand a chance to conquer new niches in the market. On the other hand, there is the danger of investing in the wrong technology – and more important: without further training for workers and management – to be superseded by the young, fresh competition.

Color management will not become a plug-and-play solution by growing together with different digital media. Pioneers will not get around having to try out much for themselves. This testing must be systemized and planned into everyday production.



2000: Amendment to the 2nd German Edition

Even two and a half years after the publication of the first edition, the situation is still sketchy. On the one hand, ICC-based color management together with high-quality inkjet printers have created lower costs for digital proofing systems.

On the other hand, there is still no consistent integration of ICC profiles in the operating system, application programs, printer driver and PostScript RIP. Many problems with regards to color management do not arise if one concentrates, from the start, on optimizing the traditional CMYK-based working method in the graphics industry.

2007: Amendment to the 3rd German Edition

The graphics industry has changed dramatically in the 7 years since the 2nd edition. Just like with the introduction of PostScript and DTP programs, the cost of repro equipment has sunk dramatically thanks to color-management technology. In many cases application software like Photoshop also take on this role. Many agencies and publishers are currently setting up their own repro departments and the number of classic prepress businesses has greatly decreased.

However, even 9 years after the publication of the first edition, we still cannot speak of a stable technology. Herein lies the reason why the 3rd edition was finished a number of years later than planned. The standards on which the whole of color-management technology is based, are still deficient when it comes to integration in operating systems, application software, printer drivers and the data formats PostScript and PDF. The ICC standard for the use of color profiles remains, in many areas, insufficient for the color management of CMYK print data.

Whoever wants to use color management purposefully and safely needs to know where this technology delivers predictable results and how potential problems can be avoided right from the start. For me, as an author, it was much more difficult to explain strategies for avoiding problems, than it was to describe the functionality of color management. Work on this subject has led to me redesigning and rewriting the 3rd edition many times. It has now a focus on strategy for color-management implementation. Some central points of this strategy depart from recommendations that many “color-management

gurus” have preached over the last 10 to 15 years. For example, I recommend that printers only accept PDF/X-1a files as print ready instead of PDF/X-3 files. The varied color-management options should only be used with great caution and control in layout programs and when producing PDF data. Whoever wants to prepare print data for different printing standards, I recommend pure CMYK-PDF/X-1a data as the base format and color transformation with carefully checked DeviceLink profiles.

The necessary theoretical basic knowledge for this is given in this book.

2008: Amendment to the English Edition

The English Edition is based on the 3rd German Edition but also takes a closer look at the developments of SWOP, GRACoL and G7 in the US market.

Digital Color Management – a Didactic Play in 7 Chapters

The first two editions of this book concentrated mainly on technological aspects of color management. In this third edition, particular value has been placed on the communication among those involved in a print production. Here is a short introduction to the different protagonists who appear time and again in the following 7 chapters:

The print buyer

The print buyer depicted in this book is concerned professionally with the purchasing of photography, graphic design and repro services as well as the production of printed matter. In the agency environment and publishing houses he is called the production manager and in large industrial companies he works in the marketing department. If the print buyer observes certain basic color management rules when allocating contracts, he can provide for a possible trouble-free production cycle.

The photographer

After changing to a digital method of production he must increasingly consider how he can reliably communicate the color of his images to the print buyer and prepress.

Prepress (graphics and repro)

While in the past the work was clearly divided between the graphic designer and repro specialists, today there are more and more graphic designers who edit photographers' digital image data for print and send their layout artwork as PDF print data to the printing house. And so they take on classic prepress tasks. However, despite color management, there are still tasks that are best left for the repro specialists. For this reason the aforementioned appear separately in this book as well as in union.

The printer

He is responsible for producing printed matter from the data provided by graphic designers or repro services, which meet the print buyer's expectations. The clearer the printer can communicate how the print-ready documents should be composed, the more trouble-free the production.

The banes of color management

Those of the above protagonists who are seriously concerned with color management quickly become familiar with some unpleasant banes: the optical brighteners, that help make some papers a gleaming white. They are a main reason why color management is more problematic in practice than the theory suggests. Whoever wants to use color-management tools professionally must come to terms with these banes.

