MANAGEMENT OF REPROGRAPHIC SERVICES IN LIBRARIES & INFORMATION CENTRES*

V.K. Rangra

DESIDOC, Metcalfe House, Delhi-110 054

Abstract

Explains briefly broad areas of reprography. Describes xerographic process and growth of the reprographic industry with special reference to plain paper copier (PPC). Gives criteria for selection of PPC and tabulates data of four prominent full colour PPCs. Gives details of a new portable colour PPC. Discusses the problem of copyright in photo-copying and charging for the photocopy/xerox service.

Reprography Defined

The term reprography was first introduced at the First International Congress on Reprography held in Cologne, Germany in 1963. Landau defines it as "the art of producing single or multiple copies of documents whether by photographic or other means." Ibrahim calls it a "technology of producing or reproducing visual communication in an inplant operation." Harrod gives a more comprehensive definition as "the reproduction in facsimile of documents of all kind by any process using light, heat or electric radiation-photocopies, microcopies, blue prints, electrocopies, thermocopies, etc; also reproduction by methods of duplicating and office printing."

Areas of Reprography

Reprography, thus broadly includes photocopy, microcopy, duplicating, and in-house printing and in general, is characterised by its small scale of operations and non professional nature of its operatives.

Photocopy is an adaptation of photography, whereby copies are produced directly from originals without any need for recreation of an

---

* Presented at the Seminar on 'Management of Govt Libraries & Information Centres organised by AGLIS during 11-13 Nov 1989 at Goa

image to make a master for subsequent reproduction. Micrography deals in images of reduced size i.e. microforms (microfilm & microfiche) which require some special apparatus – viewers/readers – to make them readable. The more popular among them is the reader-printer which enables a microform to be viewed or read as well as yields a copy of the same, if so desired. Duplicating includes spirit duplicating, stencil duplicating (also known as mimeographing), and gelatin process. Small scale offset printing is indistinguishable from duplicating. Even offset (litho) machines are often described by their manufacturers as 'offset duplicators.'

Selection of Reprographic Methods

Several points need to be considered while choosing a reprographic system. These include : running cost (cost per copy), capital cost, number of copies required, type of the original to be copied (bound volumes, drawings, over-sized documents, etc), colour of the reproduced copy (B/W or colour), speed and convenience of use, skills required for operation, and durability (life of the copy).

Photocopying Processes

Based on the chemistry of the process and also on the nature of the sensitive surface on which the copy is made, the photocopying processes could be grouped into four categories. These are : a) photographic – the sensitive coating being silver halide as in the conventional photography; b) diazo or dyeline; c) thermographic or heatcopying, and d) electrostatic or electrophotographic copying. The configuration these process is depicted in Table 1

Electrophotography/Xerography

The electrostatic or electrophotographic method better known as xerography has scored over all the other methods in terms of economy, speed and use in operation, the main considerations in adopting a photocopying system.

Xerography Process

Chester Carlson of the US produced the first electrostatic copy on 22 Oct 1938. Later, the process was named 'xerography,' a Greek word for dry writing : copying without moist paper or chemicals. Various steps involved in the process include :

- an electric charge is given to a selenium surface having metal backing. Selenium does not allow the charge to leak away to the metal while it is kept in the dark;
- the image of the original to be copied is projected on to the selenium surface. The light from the non-text areas allows the electric charge to disperse to the metal, but the text being dark reflects

Table 1. Configuration of various photocopying processes

Photographic process	Camera process	Camera processes (Variable sized copies)	Non-camera or contact processes (Same sized copies)
Photographic processes (Silver halide)		Photostat	– Negative/positive (reflex) – Chemical (diffusion) transfer – Autopositive (direct positive)
Non-photographic process			Dyeline (diazo)
			Thermographic (heat) copying – Thermofax – heat transfer – dual spectrum
	Electrophotographic copying may give same or variable sized copies.		

no light and so the charge is held where the text falls on the selenium surface. Thus, an invisible pattern of electric charge remains in the shape of the text or other marks on the original;

- to make the text visible, carbon powder with opposite electric charge is cascaded over the selenium surface. The powder sticks to the surface;
- paper is brought against the surface and by means of further electric charge, the powder is transferred to the paper;
- the paper is heated to fuse the carbon on it. Carbon being a very stable substance, gives the electrophotographic copies the advantage of permanence.

Xerography and Electrofax

Copying on to plain paper is the original xerography. When coated paper (with zinc oxide) is used, the same process is called Electrofax. The advantages of using coated paper are that the reproduction of tone illustration is better than in xerography and that every copy is in effect a lithographic plate – it can be used to obtain a hundred or so copies on a small offset machine.

Growth of Xerox Technology

In 1950, xerox machines were made available to public. In 1960, the Xerox 914, named because of its ability to make copies upto 9'' × 14'' size, was introduced. Since then many sophisticated models have come into the market.

The first indigenous, commercially available automatic copier known as 'Oce 1250 Electrocopier' was introduced in India by the Das Reprographics Ltd., Calcutta, which used zinc oxide coated paper. Later, the Advani Oerlikon Pvt. Ltd. introduced 'Auto-600' plain paper copier. There are about 20 firms which are producing PPCs in India. At present, Modi Xerox (Modi in collaboration with Rank Xerox) dominates the Indian scene with 43.2 per cent of their market share This year they have introduced the '1038' model – a programmable desktop copier with many value-added features. But all these xerox models available in the Indian market are black and white. The colour models are yet to be introduced in India.

PPC Market

The plain paper copier (PPC) market is growing very fast. The number of installed copiers in the US by the end of 1987 reached 4.2 million. The ten top makers of PPC in the world are Canon, Xerox, Sharp, Savin, Minolta, Mita, Konica, Harris/3M, Ricoh and Toshiba which control more than 85 per cent of the US market, the first three accounting 50 per cent.

Colour Copier Technologies

The first colour copier was introduced by 3M Company in 1974. The technologies being used in colour copier are electrographic, photographic, thermal transfer and cycolor. The comparison of these technologies in the production of quality colour copies is given in Table 2.

Criteria for Selection of a colour PPC

While selecting a colour PPC, the features that may be noted for comparison include : type, imaging technique, copy paper size, paper capacity, warm-up time, copying speed, reproduction ratio (enlargement and/or reduction), copy colour, density control, multiple copies, dimensions and weight, power supply consumption, etc. The price of a colour PPC is about $ 20,000 upward.

Some Colour PPCs

A comparative study of some of the full colour PPC models, namely, Brother CC 5500, Canon CLC, Canon BJ-A1, sharp CX-7500, in the terms of technical specifications and consumers' requirement is given in the Appendix.

Table 2.: Colour Copier Technologies – a Comparison

Technology	Speed (cpm)	Copy hardware quality	Cost of colour ppc (in thousand dollars)	Cost per copy
Electrophotographic	5–23	Good	20–60	$0.10
Photographic	1–1.7	Excellent	16–60	$1.15
Thermal	1	Good	10	$0.50
Cycolor	2	Good	<10	$0.60

A Multipurpose Portable Colour PPC

Panasonic has introduced a light-weight colour copier with several new features satisfying the needs of the new generation of copier users. Its model, COPILMAN. FN-500, weighs only 6 kg, has 14 colours with copying magnification of 50, 100 and 200 per cent. It has the potential of producing hard copies of TV/VCR screen images (with the help of an adapter).

Problem of Copyright

Photocopying (in broader sense, any kind of machine reproduction) comes under the provisions of copyright and affects the document supply services of libraries and information centres. In the world over, the doctrine of 'fair use' permits reproduction for legitimate purpose of material taken from a copyrighted work to a limited extent, that will not cut into the copyright owner's potential market for sale of copies. Under the term 'fair use' are covered criticism, comments, news reporting, teaching, scholarship or research. In the US, some guidelines have been laid down for this purpose under which a teacher or his/her agent (e.g. librarian) can make one copy of a copyrighted work for research/teaching or preparation thereof. Multiple copying for classroom use is allowable only if it meets the test of brevity, spontaneity and cumulative effect. The Indian Copyright Act 1957 as amended in 1983 also permits reproduction of copies when made in the course of fair dealing and for educational or official purposes.

Charging for Supply of Photocopies

Should the photocopying service be charged? The answer lies in the policy of servicing institution. In a Government R&D institution where the users are the employees who are dependent on such service, it may not be advisable to levy any kind of charge. But the misuse must be curbed. On a single request which should be once a day, only one copy of one paper normally of not more than 10 pages, may be entertained. The indenter may give an undertaking in his/her request that the photocopy is required purely for research/ teaching/official purpose and that no commercial gain of any kind will be made out of it.

Acknowledgements

The author is thankful to Shri S S Murthy, Director, DESIDOC, for granting permission to present the paper in the AGLIS Seminar.

References

1. Landau, T. Encyclopeadia of librarianship. Bowes & Bowes, London, 1966.
2. Ibrahim, Karen. Exposing the meaning of reprography. Graphic Arts Program 16(10), 1969.
3. Harrod, L M. The Librarian's glossary and reference book. Gower, London, 1982.
4. Narsi, W Z. Reprography. Ency of Lib & Infor Sc 25:230-39, 1976.
5. New Peter, G. Reprography for librarians. Clive Bingley, London, 1975.

6. Excerpts from the speech of Chairman & President, Modi Xerox. India Abroad 15 Oct 1989; 72-3.
7. Copier Special. Office Equipment & Products 18 (126), 1989; 111-46.
8. Goldman, A A. Copyright – Reproduction of works in libraries. Ency of Lib & Infor Sc 6:1971; 72.
9. Narsi, W Z. Copyright and the information professionals. Ency Lib & Infor Sc 43: 1988; 79.
10. Thairani, K. Copyright : The Indian experience. Allied Publishers, New Delhi, 1987.

APPENDIX

Comparative study of some full colour PPCs

Specifications / Brand Model	Brother CC 5500	Canon CLC	Canon BJ-A1	Sharp CX-7500
Type	Console	Console	Console	Desktop
Imaging technique (Technology)	Cycolor	Electro-photography	Bubble ink jet	Electro-photography (Xerography)
Copy paper size	Max A 4	Max A 3 Min B 5	Max A 1 Min A 4	Max A 3 Min B 5
Paper capacity	200 sheets	250 upper + 250 lower	A 1 roll + 250 sheets	250 upper + 250 lower
Warm-up time	3 min	8 min	3 min	7 min
Copying speed	1.5 cpm	5 cpm	A4 1.5 min A1 6 min	7.5 cpm
Reproduction (magnification) ratio	1.07 to 2	Zoom 50-400%	Zoom 50-1200%	1.07 to 1.41
Colour copy	Full colour	Full colour	Full colour	Full colour
Density control	7 steps	–	–	ATDC
Multiple copies	1 to 99	1 to 99	1 to 99	1 to 99
Dimensions (mm)	676×534×985	930×735×946	1416×1225×1070	665×875×665
Weight (kg)	107	250	420	160
Power consumption	AC 100-240v	AC 100-240v	AC 100-240v	Rated local AC voltage