DESIDOC Bulletin of Information Technology, Vol. 23, No.3, May 2003, pp. 11-19

Computer-aided Print Management Information System for Printing Presses

Parveen Gupta & J V Ramakrishna

Abstract

To provide management control over the day-to-day operations of printing business, the computer-aided print management information system plays a vital role. It is extremely useful in streamlining the databases and comparing and assessing the same for decision making as regards to business and technical requirements. Various modern print management information systems are available through different manufacturers that are made suitable for varing number of operations, departments and units. This paper discusses management information system (MIS), computer aided print MIS, benefits of computer aided print MIS for printing presses, and so on. Brief details of printing press using print MIS are also given.

1. INTRODUCTION

The development of computer-aided print production control system is a natural outgrowth of the entrance of computer and information technology (IT) into almost every phase of printing operations. Sunk in the sea of untapped information flow, majority of the printing presses in India are unscientifically managed. In such printing presses, there is a need of implementing fully integrated computer-aided print production control system for managing scientific press routine through management information system (MIS) that will not only increase their print production capacity and efficiency but help them to survive the current economic crisis also. In India, this concept has still to catch up, whereas most of the top printing presses abroad have already been using computer-aided print MIS software to compare and assess business and technical data for decision-making.

It is ironical that, considering the international printing scenario, still the printing presses, having in-house pre-press, press and post-press sections backed by four to five 4-colour printing machines, have been using such print MIS in a haphazard manner and that too to a limited extent only. Generally, they develop such system in-house and recommend them for selected departments and operations only, and worth mentioning avoiding database networking. Following the same trend, the cost of implementing print MIS largely varies from Rs. 25 lakh to Rs. 1 crore, depending upon the type and extent of networking, connectivity, number of operations, departments and units-the system is made suitable for, maintenance contract, and workload of printing jobs, etc. The increasing workload of particularly short-run print jobs, time bound urgent jobs, emergence of digital technology and current developments in microcomputer based systems now make it possible for all printers to take advantage of computer-aided print production control system.

2. WHAT IS MIS?

Management information system is defined as the systematic and organised way

of providing informational support to the managerial functions of an organisation. The computer-aided MIS utilises computer hardware, software, manual procedures, models for analysis, planning, control and decision-making, and a database. In other words, the computer-aided MIS is an automated system that presents information, both internal and external to the business, that aids in making specific set of decisions. The computer-aided MIS provides information that is more useful, accurate, timely, relevant, effective and complete as compared to the conventional MIS.

The scientific standard press management routine, developed by computer-aided print MIS system, is a methodology of working that should be adopted by a printing press to execute various print jobs received by the press from time to time. It is extremely essential in order to ensure error-free, quick, and most economical execution of the print jobs. But to work according to the standard press management routine, every press must lay down certain rigid and scientific press procedures by utilizing modern IT and computer-aided MIS components.

3. GENERAL MIS MANAGEMENT AND CONTROL SYSTEM

The general MIS management and control system provides desirable accuracy for not only financial management and production management but also marketing management, labour management, material management, inventory/stock management, quality control, cost control, and miscellaneous management. Made up of various IT and MIS components, the management production control system retains its integrity and the components functions smoothly to ensure accomplishment of the goal of maintaining scientific management routine for an organisation like a printing press. (Figure 1)

As far as printing presses are concerned, various modern print MIS logic systems are available through different manufacturers having distinguishing feature (discussed later). Most of such print MIS systems are made up of up to '11' elements (as indicated in figure 2) to perform all the standard routine activities of printing presses shown in figure 3 that come under the standard press management routine for developing a computer-aided print MIS system.

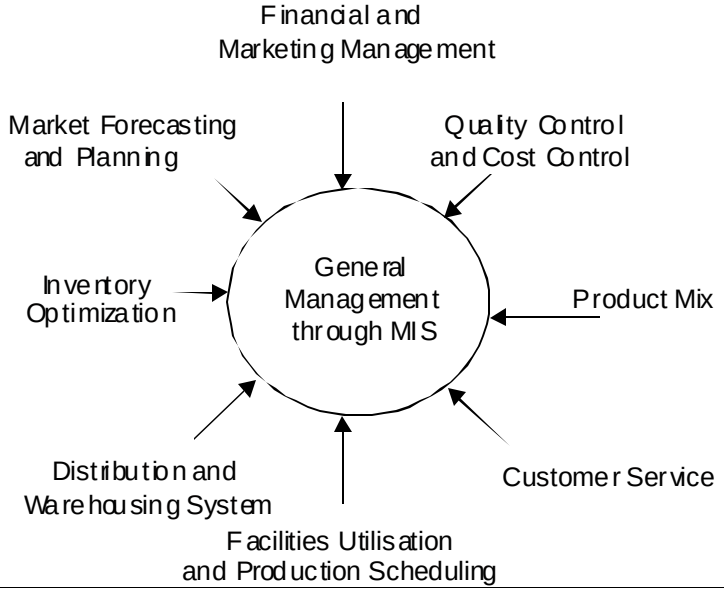
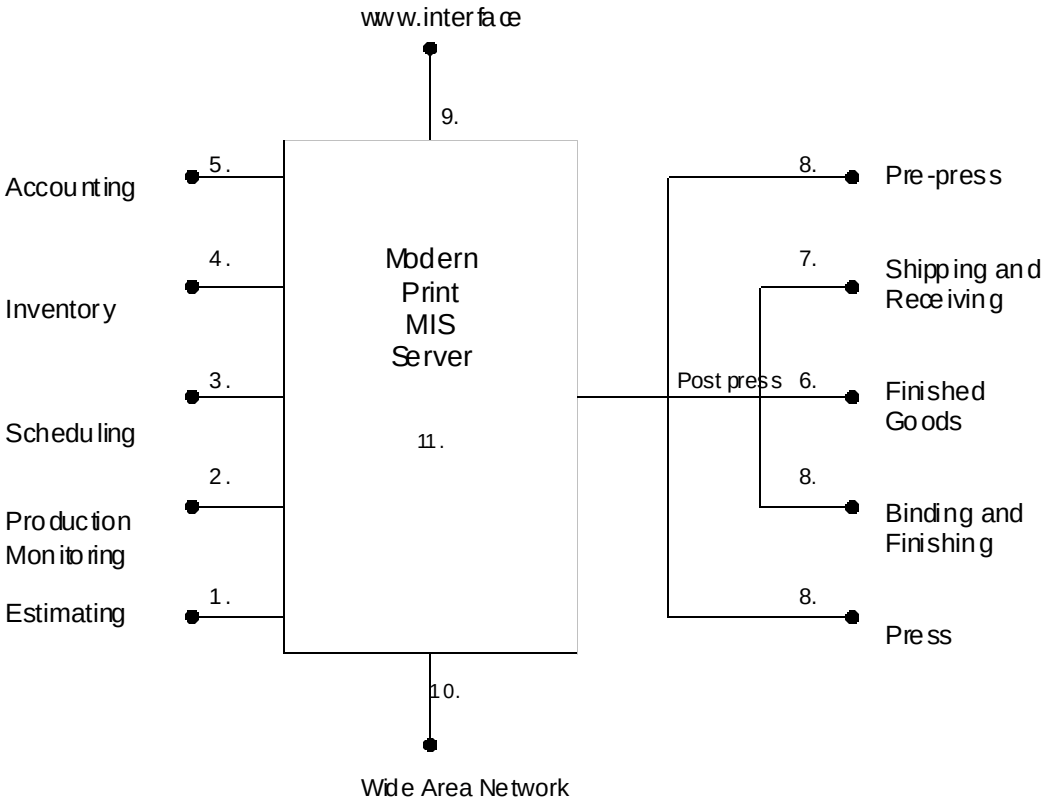


Figure1. General MIS Management and Control System



1) Estimating and quoting
2) Production planning, order entry and job tracking
3) Integrated scheduling
4) Inventory management
5) Costing, invoicing, purchasing and financial reporting
6) Finishing goods inventory fulfillment
7) Job delivery and client interaction
8) Shop floor data exchange using electronic forms
9) Web interface and e-services
10) Multi company and multi division networking
11) Centralled database, human, machine, material and process analysis, and management reporting archives

Figure 2. Modern Print MIS Logic System for Printing Presses

4. BENEFITS OF COMPUTER-AIDED PRINT MIS FOR PRINTING PRESSES

In today's technologically advancement phase, the role of MIS cannot be ignored. Without the scientific MIS, it would probably be difficult to complete any project without hurdle. Estimating, costing, order processing, stock control, purchasing, invoicing, forecasting, telesales, shop floor data collection, production scheduling, accounting, personnel management and plant management, etc., are the major focus areas in which the computer-aided print MIS system works and offers large number of advantages not only to the printer but also to the customer of the job. Some of the main benefits are:

- Full integration of operations, and improvement in allocation of physical

Figure 3. Standard Press Management Routine Flow Chart

(materials and machinery), financial and human resources particularly under constrained conditions

- Minimizes the possibility of any kind of dispute between the printer and its client regarding specifications of job, colour, print quality and quantity of the job produced, etc.
- Increases the efficiency of output in terms of print quality and reliability, achieve major improvements in productivity
- Provides high quality service to customers.
- Achieves targets and schedule, timely and easily, in terms of overall profit and reduction in time and cost
- Ensures the optimum utilization of various forms and documents usually maintained by the printing press with regard to production, quality control and billing, etc.
- Provides full security to pilferage of all kinds in the press. No raw material, semi-finished or finished job can leave the press without being properly recorded as per the laid down procedure
- Helps to keep complete information with a specimen copy of each job done by the press
- Keeps a check on the inventory and ensures timely availability of the raw materials required for various jobs

- Keeps the management well informed about the internal performance, work position and status of each and every job being undertaken by the press.

In other words, we may accept that printing can be a very efficient, economical, expedient and interesting process if a good interactive information system is followed throughout. To improve the customer service and to remove other possible inconveniences to print buyers and printers, MIS can prove a boon to any printing press.

5. COMPUTER-AIDED PRINT MIS

The computer-aided print MIS system is basically a computerised man-machine system that produces information for use in managerial problem solving and decision-making in day-to-day activities of printing business. The accurate and timely information, that is the heart of computer-aided MIS, after specific comparisons, is utilised to lay down valuable standard press management routine having certain functions that are of vital importance to the printing press for improving their interface with the outer environment viz print buyers, consumables suppliers, maintenance engineers, etc. The processed standard press management routine is also stored in memory awaiting future use. The bar code system can also be used for information entry as well as for development of the computer-aided MIS for printing presses. (Figure 4).

The computer-aided MIS receives data, process it and output the information based on data according to the given instructions. However, the input does not arise all of a sudden but the data is collected automatically through a network of computers, linked to an organisation's central database unit, as soon as it is known rather than at the end of a specific time frame. This 'real time' collection of data (from computers being used at the productive and non-productive departments) greatly enhances the printing press's ability to assess the status of any particular operation and correct problems as they occur. But the data like the details of client, information of inventory, job status, operating costs and other expenses related to a specific job etc., can be gathered at the end of a shift or a work day.

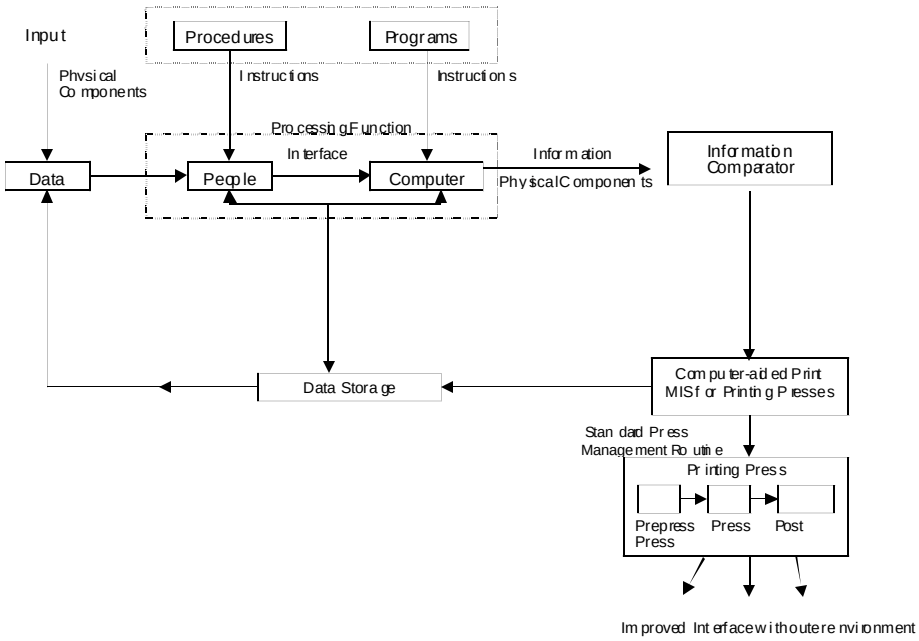


Figure 4. Computer-aided Print MIS Components Model for Printing Presses

For example, a printer can keep track of the kind and quantity of paper, printing ink and other consumables used for a particular job, and the inventory conditions for the same. The computer-aided print MIS system will alert the press management when inventory of particular paper, printing ink or consumables runs low, so that the orders can be placed accordingly.

The advantage of the computer-aided print MIS system is that whatever information is known about a particular job is available immediately. Thus the customer service representative of the printing press, in response to print buyer's queries, can look up all aspects of customer related information like quotations, invoices and the status of any printing job instantly on the computer screen and tell the print buyer about the job progress, whether there have been any delays, and when the job can be completed and delivered. The computer-aided print MIS system also greatly reduce the amount of paper work to be done by functionaries at each individual department/work-station, thus making data entry faster and accurate.

6. REDEVELOPABLE SYSTEM DEVELOPMENT PROCESS

The development process produces an information system that is useful for a period of time. At some point, there may be certain changes in the organisation, its policies or in its need for information. Such change is then fed back to the system development process and a new information system is developed. Hence, systems are developed, used, modified, and redeveloped as per the requirements. No doubt, there cannot be a single, universally best and applicable system in the world (Figure 5).

The growth path of the system is exactly in tune with the growth path you anticipate for your business. This long-term expandability and modification feature in development process particularly appeals to the printing presses, which already use computer-aided print MIS system and mostly have recurring and generalised print jobs. For example, the job data entered about the job as it passes through the press can be compared to the original estimate and used to update the estimating information so that estimates are more accurate and can more closely reflect the actual cost to the printing press of producing the job. Thus the computer-aided print MIS system can provide the type of accurate information needed to continually update and correct the standard press management routine.

7. E-COMMERCE VS PRINTING

The possibility of applications of e-commerce in printing business is wide

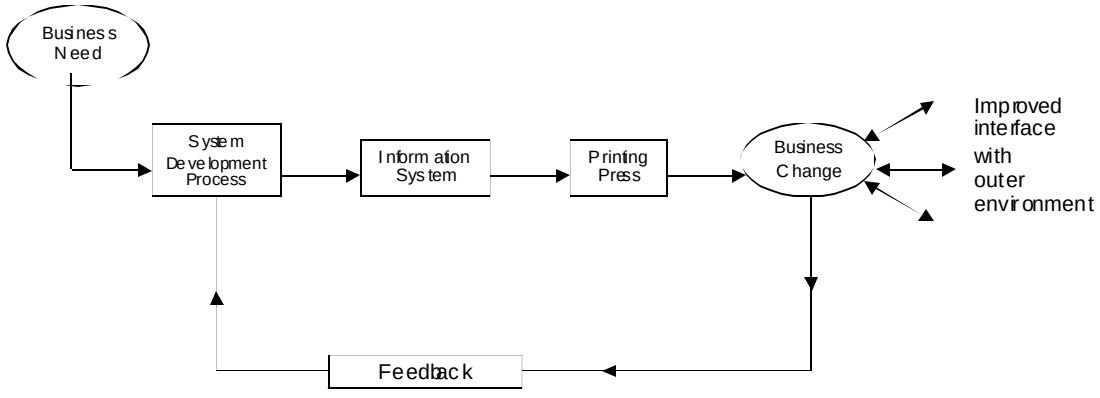


Figure 5. Redevelopable System Development Process for Continuously Changing Printing Business

depending upon the timeliness, urgency, reach and economy, etc. Through internet, printing jobs could be registered. Presses can quote and negotiate the final price. Printing business can be managed more effectively, boosting communications with clients, preventing hold-ups in printing and delivery schedules, and keeping employees better informed. Further, not only the print buyers can provide the specifications of jobs to be printed to the printer through e-commerce but also they can transmit the manuscript over e-mail or design sent as ZIP file. Proofs can also be cleared and 'OK' on the computer itself. Other attractions include monitoring jobs in progress, viewing documentation of past jobs for easy reference, the ability to order or re-orders, making amendments and specifying schedules. Possible role of e-commerce in printing may be marketing and trading with existing customers, giving customers the facility to produce catalogue for a client with product images, and capturing new business, etc. Last but not the least, the e-commerce companies, like Xerox Corporation's ePartners programme, printeurope.com, print-packaging.com, printchannel.com, printingenquiry.com, kagaz.com, internationalprinterpublisher.com, print-times.com, agencyfaqs.com, etc., can add advertising and promotional value to the press, thereby securing them more and more business, relieving printers as well as print buyers from various chase-up actions.

8. COMPUTER-AIDED PRINT MIS SYSTEMS SUPPLIERS

There are few companies offering MIS for printing presses. Some of these organisations are as under:

Atex Media Solutions offers Omnex, the content and information management solution for news. The other product from Atex is Prestige, an editorial solution with integrated and structured workflow for flexible, customizable and open solution for management. It also offers Classified Pagination for producing complex, high volume classified sections, which performs advertisement layout, placement and production of classified pages for newspapers at an incredible speed. Optichrome provides range of technology modules for estimating, production scheduling and so on.

California-based Impresse Corporation, co-founded by Siva Kumar and headed by Nimish Mehta, offers impresse.com, an online print procurement solution to streamline the tasks like project specification, quoting, proofing, and production management to reporting and billing. Tharstern International's Online Estimate Enquiry enables the printer's customers to request a quotation directly via the internet by inputting order information. This system is dedicated to estimating, costing, scheduling, shop floor data collection, stock, and finished goods, etc. Shuttleworth offers Shuttleworth Print Management System. This 32 bit Windows package is a fully integrated system built on a powerful rational database called Progress. SolPrint releases the SolPrintXN suite of modules, which allow customers, suppliers or staff direct access to SolPrint via the internet. Features include quote requests, estimate reviews, job raising, monitoring of stock levels and call-off order entry.

Prism Business Solutions features Prism Win System with production management and QTMS modules, which provides immediate feedback of data from pressroom equipment to the system. Established 12 years ago, Isys's Keren system offers facilities for quoting, estimating, order entry, purchase order processing, and a range of production tasks from proof tracking through to the control of finished goods. Imprint Business Systems unveils Print Master Management Information System for the printing and packaging industry. Data Design Services Limited offers ACCURA, the 32 bit windows print management system. DiMS! system organises print development, selling, and implementation, the true end-to-end management information solution.

LLS Technics's Winprint estimating and MIS system includes integrated modules which print job tickets, deal with costing, print invoices, send accounting details to accounting packages, and control paper and

other raw materials. Vaccumatic unveils its Provin live data collection system. Linked to on-machine counting hardware, it provides real time data direct from the press. Window-base MIS from Cabbell Computers covers everything from job scheduling to estimating and carton designing.

Future Solutions of Kingston-upon-Thames offers Solprint, a 32 bit Windows product, whereas Software Technetics offers Milpara open system. Optimus 2020, the latest version of Optichrome Computers System Limited, that exploits most up-to-date technologies and computer architectures, to provide a print MIS that can track the status of print jobs from enquiry to invoice, provide market analysis, and also allow even closer links with both suppliers and clients, via the internet. Optimus 2020's high performance and scalability is fully realized when used with Sun Microsystems platform. Among other print MIS include Sanderson, Focus Advantage, Pecas Vision, Pics, Print Café, Printsmith, and Printcost for windows, etc.

Another valuable and beneficial tool to the printers is CIP3/CIP4 that is a Switzerland based international body known as International Cooperation for processes in Pre-press, Press and Post-press. Recently CIP4 replaced CIP3, by adding the fourth 'P' of 'Processes'. Today the need of the hour in the printing sector is integration between the MIS and CIP3/CIP4. The Job Definition Format (JDF) in the CIP4 is prepared to include details of the pre-press, press, post-press and delivery functions pertaining to any print job and Job Management Format (JMF). Among the emerging software systems that taps the potential of CIP4's JDF, a job ticket specification that has information in a standardized format, are Heidelberg's Prinect, KBA's Opera, Komori's K-Station, and MAN Roland's PECOM (Process Electronic Control Organisation and Management).

9. BRIEF DETAIL OF PRINTING PRESS USING PRINT MIS

Colin Clapp Limited, a Hertfordshire UK based printing company, manages its entire production process by Optichrome Computer Systems Limited's (OCSL) Optimus 2020 MIS. The company is an innovative printing and direct mail specialist having high quality 4-, 5- and 6-colour Heidelberg printing presses. The company has also developed a complete direct mail facility, providing an integrated 'disk to door' service, including electronic repro, laser printing, litho printing, inline ink-jetting, data processing, attaching, finishing and fulfilment mailing.

Running on a powerful Sun Microsystems Enterprise 250 server, the Optimus 2020 system integrates continually updated information from production, sales and accounts departments of the company, yielding faster responses and accurate scheduling. The Sun server provides a highly reliable and stable environment for the Optimus 2020 system. It enables rapid generation of accurate estimates with storage of historical data and comprehensive estimate reporting function. This print MIS also have the ability to link the company's two sites - the print shop and the mailing house, to share data in order to compare print jobs, compare prices, report on progress and so forth. Both the printing site and the mailing house have their own databases in Optimus 2020. Further collecting the data remotely via the Remote Data Collection Module, the company has eliminated manual time sheets for 150 personnel and reduced data input administration, whilst providing up-to-the-minute information on the progress of jobs in the company, together with accurate information on costs incurred for each job.

Recently, Colin Clapp Limited has added a link for its Sage accounting programme to the Optimus 2020 system, to enable all of the data required for the company's invoices to be generated in 2020 and transferred into Sage. This has speeded up the invoicing process, by feeding all of the necessary information, including technical specifications, prices and costs directly into Sage, and enabling the invoices to be printed, eliminating the need for each one to be typed by hand.

Sun Enterprise 250 server, the main hardware/software requirement for Optimus 2020 MIS, can be easily upgraded to accommodate future growth, whilst still providing the highest level of reliability and availability.

CONCLUSION

MIS technology is all about providing management control over the day-to-day operations of printing business. Absolute control is rarely possible, but a good computer-aided print MIS system removes many of the variables, minimizing the risks of sudden and unexpected problems and shocks to the corporate system. The perfect system does not exist, but any system claiming to provide control over commercial functions should at least be able to efficiently produce and estimate jobs. It should also be able to link estimating and accounting, produce reports in any format you like, being readily and inexpensively ungradable, and being secure, particularly if the system is used across multiple sites.

It is important to understand that coordinating and controlling printing business is more than just performing the production tasks of running a printing press or operating a printing machine. Planning of whole print production requires not only a thorough understanding of production but it also demands functionaries having multiple skills beyond the reproduction of text and images on paper by ink.

REFERENCES

1. Sarkar, N. N. Art and production. Sagar Publications, New Delhi, 2002. 67-97.
2. Adams, Faux & Rieber. Printing technology. Delmar Publishers Inc., U.S., 2002. 559-77.
3. Hills, Philip J. Information management systems. Ellis Horwood Ltd., U.K., 2002.
4. Basandra, S. K. Computers for managers Global Business Press, New Delhi, 1998. 203-45.
5. O'Brien, James A. Management information systems. Ed. 4. Tata McGraw Hill Publishing Company Limited, New Delhi, 2000.
6. Singh, H. K. Management of marketing information system. 2000.
7. Mohan, P. Management information system and computer application. 2000.
8. Exhibitors' guide of PIRA MIS show 2003 and MIS 2003 expo, UK.
9. The abc of MIS. *Print & Publishing Magazine,* Oct./Nov. 2002, 26.
10. *Print & Publishing Magazine,* Feb./Mar. 2002, 27-28.
11. http://www.optimus2020.com
12. http://www.globalprint.com
13. http://www.uk.sun.com
14. http://www.printcafe.com
15. http://www.dotprint.com

Contributors: **Shri Parveen Gupta** is Senior Technical Assistant 'A' at Defence Scientific Information and Documentation Centre (DESIDOC), Metcalfe House, Delhi-54.

Shri J. V. Ramakrishna is Scientist 'C' at DESIDOC, Metcalfe House, Delhi-54.