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Current and Future use of MIS/ERP Systems in Production Printing in the U.S.

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Executive Summary

This research was designed to examine the implementation of MIS/ERP solutions in the print marketplace.

Management Information Systems/Enterprise Resource Planning (MIS/ERP) solutions provide an automated workflow for print production. The research reflects that print establishments should expand their efforts to implement and focus on the development of MIS/ERP systems in their production printing operations to take advantage of the significant business benefits these systems can provide. The MIS/ERP system providers should put more effort into making their systems more user-friendly and should promote those systems to reach a wide range of print establishments, doing a better job of marketing and educating printers on the value of MIS/ERP systems in today's competitive print marketplace.

Objectives

One objective of this research effort was to identify the current use of MIS/ERP in the production printing arena in the U.S., including the benefits and drawbacks. Another objective was for the research team to identify non-users of the MIS/ERP systems in the Printing and Graphic Arts Industries and investigate their reasons for not adopting MIS/ERP systems in their operations.

Approach

The research was performed in four main stages:

1. Information Collection: A list of printing establishments in the U.S. was acquired from affiliates of the Printing Industries of America/Graphic Arts Technical Foundation (PIA/GATF).

2. Survey: A survey questionnaire was developed and was sent to two MIS/ERP vendors for review and comment. Once completed, the survey was posted online. A cover letter inviting participation on the survey was e-mailed to 3,396 printing establishments registered with PIA/GATF throughout the U.S.

3. Telephone Interview: Two sets of questionnaires, one for users and another for non-users, were developed and e-mailed to respondents who were interested in providing more information for this research. Eight users and eight non-users responded to an additional e-mail survey. From the total non-respondents who were interested in providing more information, nine were selected randomly and telephone interviews were conducted.

4. Analysis of the Results: After analyzing the results the following key findings were identified.

Key Findings

- MIS/ERP systems have been in use in the majority of respondent printing establishments for more than a decade. The majority of these users have deployed MIS/ERP in the print production area.
- MIS/ERP in print production drives business growth.
- Non-users are either unaware of MIS/ERP solutions and/or do not understand the return on investment delivered by MIS/ERP solutions, and this is inhibiting their willingness to implement these systems.
- Access to real time data and better business decision making are the primary benefits of MIS/ERP systems in the print production area, according to users. The primary problems with implementation revolve around staff training and consistent staff utilization.

The research provided insight into the use of MIS/ERP systems in the print production area of print establishments in the U.S. MIS/ERP solutions in print production have a great potential for driving business growth. Print establishments that have not yet adopted these solutions need to understand the benefits and consider the option of implementing them in their print production areas. The message to the vendors of these solutions is that they need to do a better job of educating the market and they also need to make these systems easier to use. According to the research, the primary problems with implementation revolve around staff training and consistent staff utilization. The solutions need to be more user-friendly, to have more automated data input to avoid data input errors, and to identify ways to reduce the inconsistent staff utilization.

Research Objectives

Background

Management Information Systems (MIS) and Enterprise Resource Planning (ERP) solutions are information systems that integrate data from all of the departments they serve and provide operations and management staff with the information they require to effectively run their businesses. These solutions attempt to integrate all departments and functions across a company onto a single computer system that can serve each of those different departments' particular needs. These solutions can serve the needs of finance as well as human resources, manufacturing or production and the warehouse. Each department has its own interface into the system that is optimized for the particular ways that the department does its work. But MIS/ERP combines them all into a single, integrated software application(s) that runs on a single database so that the various departments can more easily share information and communicate, and are working from a consistent data set. These systems deliver real-time business information that makes day-to-day—as well as strategic—decision-making more effective.

To better understand today's MIS/ERP systems and the role they play in the printing industry, it is helpful to take a look at the historical development of these systems.

The role of business information systems has changed and expanded over the last four decades. In the 1950s and 1960s, “electronic data processing systems” could be afforded by only the largest organizations. They were used to record and store bookkeeping data such as journal entries, specialized journals, and ledger accounts. The goal of these systems was to perform as decision-making support tools, but they were limited by the technology of the time.

By the 1970s, “decision support systems” were introduced. They were interactive in the sense that they allowed the user to choose between numerous options and configurations. Not only was the user allowed to customize outputs, they also could configure the programs to their specific needs. The primary development in the 1980s was the introduction of decentralized (client/server) computing. Instead of having one large mainframe computer for the entire enterprise, numerous PCs were spread around the organization. This meant that instead of submitting a job to the computer department for

batch processing and waiting for the experts to perform the procedure, each user had his or her own computer that could be customized for their own purposes.

As people became comfortable with their new skills, they discovered an increasing array of things their systems were capable of—and not capable of—doing. Computers, instead of creating a paperless society as was expected, produced mountains of paper, most of it valueless, and all of it difficult to manage. Mounds of reports were generated just because it was possible to do so. This information overload was mitigated somewhat in the 1980s with the introduction of “executive information systems” that streamlined the process, giving executives exactly the information they wanted, and only what they wanted.

The 1980s also saw the first commercial application of artificial intelligence techniques in the form of “expert systems.” These programs could give advice within a very limited subject area. The promise of decision-making support, first attempted in management information systems back in the 1960s, was step-by-step coming to fruition.

The 1990s saw the introduction of strategic information systems. These systems used information technology to enable the concepts of business strategy developed by scholars like Michael Porter, Tom Peters, J. Reise, C. Markides, and J. Barney in the 1980s. The sustainability of these applications has since been called into question by N. Carr, which Piccoli and Ives, among others, have countered.

The evolution of these systems, while they didn’t necessarily deliver results to expected levels, laid the information technology groundwork for today’s MIS/ERP solutions, which are likely just another evolutionary step on the path to improved management of knowledge and information.

Objectives

While the larger manufacturing industry has utilized MIS/ERP solutions effectively for many years, the Printing and Graphic Arts Industries have been slow to adopt these systems.

The objectives of this research effort were to identify current users of MIS/ERP in production printing in the U.S. Printing and Graphic Arts Industries and determine the following:

- How long these solutions have been in place
- The extent of their use in the industry
- The benefits and drawbacks of MIS/ERP implementation
- The effects of a changing work environment on MIS/ERP system

The research was also designed to identify non-users of MIS/ERP systems in the Printing and Graphic Arts Industries and to understand why these companies have chosen not to adopt MIS/ERP solutions.

Approach

The research was performed in four main stages:

1. Information Collection

A list of printing establishments in the U.S. was acquired from the Printing Industries of America/Graphic Arts Technical Foundation (PIA/GATF). The Print Access website (www.printaccess.com) was utilized to obtain additional contact information. The PIA/GATF membership base is comprised of 26 regional affiliates, and 20 of those affiliates were contacted.

2. Survey

A survey questionnaire was developed and was sent to two MIS/ERP vendors for review and comment. Once complete, the survey was posted online. A cover letter was e-mailed to 3,396 printing establishments registered with PIA/GATF throughout the U.S. Each e-mail invitation contained a link which took the respondent to the web site where the survey was located. To encourage participation, respondents were offered an opportunity to be entered into a drawing for an iPod. A follow-up e-mail was sent after one week and another follow-up e-mail the following week. Out of the 3,396 e-mails, 586 e-mails bounced back. 176 completed surveys were returned, resulting in a 6.26% response rate.

3. Telephone Interviews

The web survey offered respondents the opportunity to take part in a telephone interview if interested. A total of 68 respondents were interested in participating in a further survey and/or telephone interview; 38 were users and 30 were non-users. Two sets of questionnaires, one for users and another for non-users, were developed and e-mailed to the respondents who were interested in providing more information for this



research. Eight users and eight non-users responded. From the total non-respondents who were interested in providing more information, nine were selected randomly and telephone interviews were conducted.

Key Findings

Analysis of the results—The following graphs reflect the demographics of all of the survey respondents.

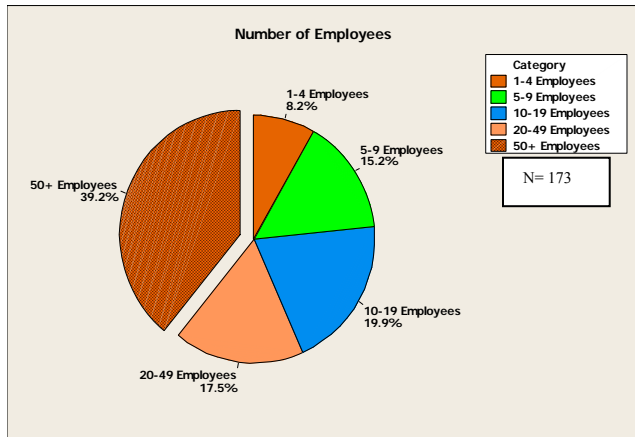


Figure A

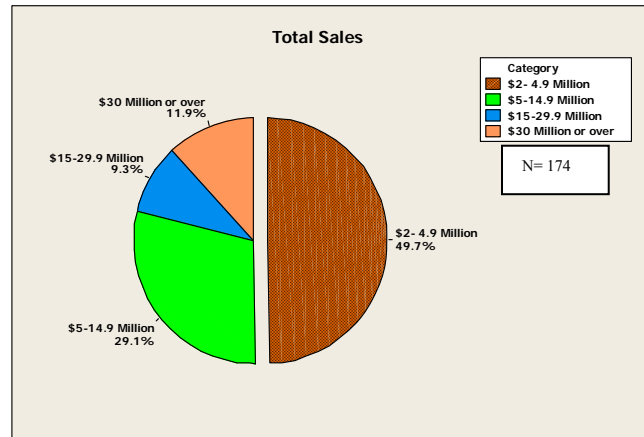


Figure B

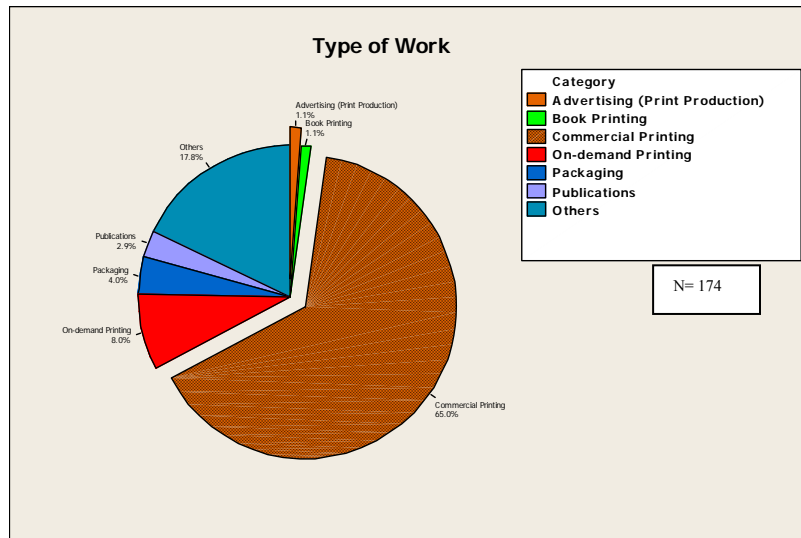


Figure C

As shown in **Figure A**, over a third of companies which took part in the survey were companies with 50+ employees. The total numbers of responses were 173 among which the companies with 1-4 employees represented 8.2% and the companies with 50+ employees represented 39.2%.

As shown in **Figure B**, the distribution of respondents on the basis of total sales was divided into four categories and a large portion (49.7%) of establishments whose annual sales were between \$2-4.9



million responded. Establishments with annual sales of \$15-29.9 million contributed the least number of respondents, with just 9.3%.

Figure C displays the type of work being performed by the responding establishments. The majority of respondents, 65%, were commercial printers.

Key Finding 1—MIS/ERP systems have been in use in the majority of respondent printing establishments for more than a decade. The majority of these users have deployed MIS/ERP in the print production area.

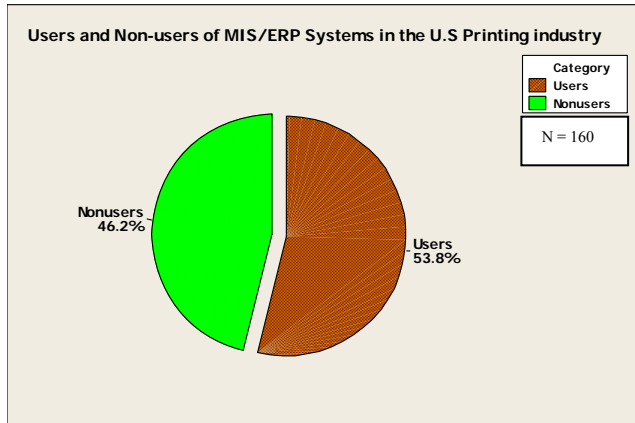


Figure D

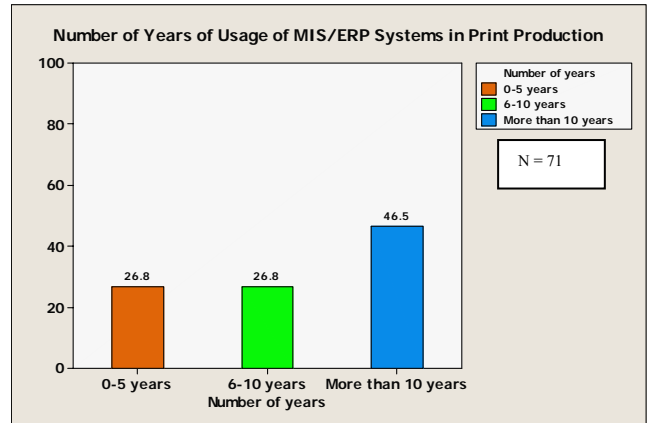


Figure E

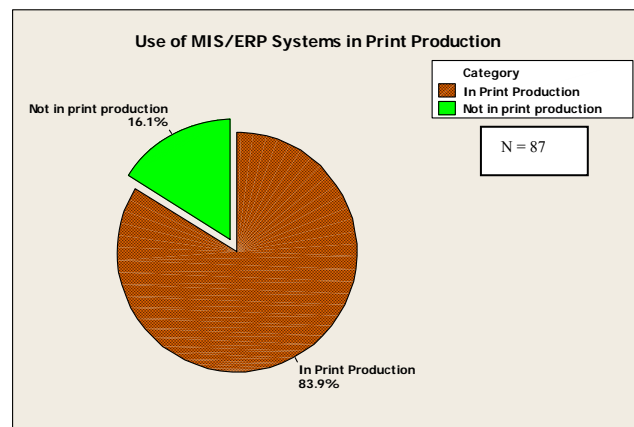


Figure F

Of the 160 respondents to the survey, 53.8% were users of MIS/ERP while 46.2% were non-users, as shown in **Figure D**.

Among users there are 46.5% or 33 respondents who have been using MIS/ERP for more than 10 years in the print production area. But a total of 83.9% of the users have been using MIS/ERP in the print production area irrespective of the number of years the systems have been installed.

Key Finding 2—MIS/ERP in print production drives business growth.

The research found that MIS/ERP systems in the production area are beneficial for overall business growth.

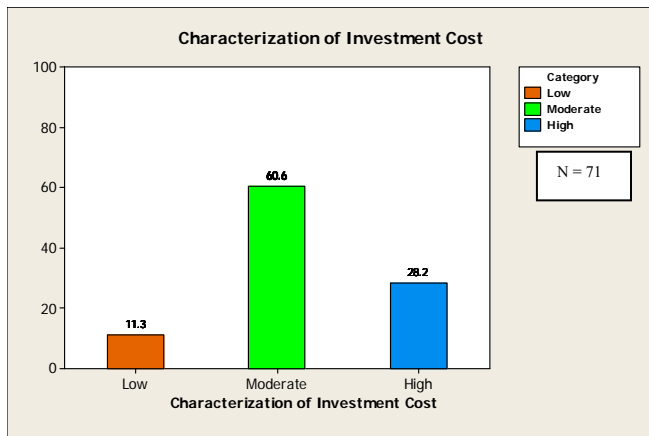


Figure G

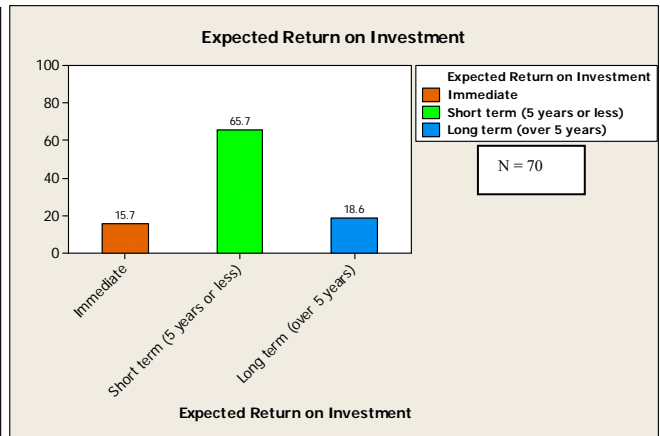


Figure H

Respondents characterized the investment cost as moderate. As indicated in **Figure G**, 71.9% of respondents indicated the investment cost was low or moderate, with only 28.2% categorizing it as a high investment.

Further, the majority of respondents (81.4%) indicated they gained a return on investment in the short term, as indicated in **Figure H**. These two figures imply a high level of satisfaction with the investment in MIS/ERP solutions for these respondents.

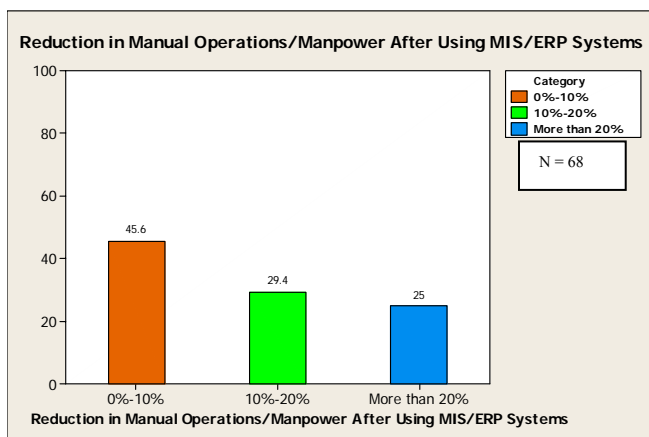


Figure I

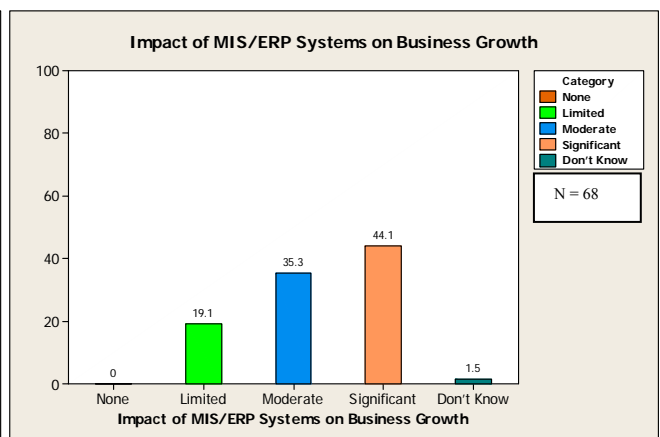


Figure J

Further, **Figure I** indicates that the use of MIS/ERP systems in the print production area has resulted in the reduction of manpower or manual operations by 10-20% for 29.4% of the respondents and by more than 20% for 25% of the respondents, a significant achievement in an industry that is under increased price and competitive pressure and experiencing shrinking margins.

In **Figure J**, respondents indicate MIS/ERP has been a significant enabler of business growth, with 79.4% reporting significant or moderate impact.

These findings were augmented by additional insights gathered as a result of the telephone interviews, where respondents reported that MIS/ERP systems contributed to improved customer relations, a paperless environment, and a reduction in manual operations. Additionally the telephone interviews revealed that the average maintenance costs for MIS/ERP systems solutions were only about 1% of the cost of the software.

Key Finding 3—Non-users are either unaware of MIS/ERP systems solutions and/or do not understand the return on investment delivered by MIS/ERP systems solutions and this is inhibiting their willingness to implement these systems.

As indicated in **Figure K**, a majority of the non-users were not aware of MIS/ERP systems, with only 44.3% being aware of the use of MIS/ERP systems in the print production area. Further, 63.6% of the total non-users, as reflected in **Figure L**, are not willing to invest in these systems.

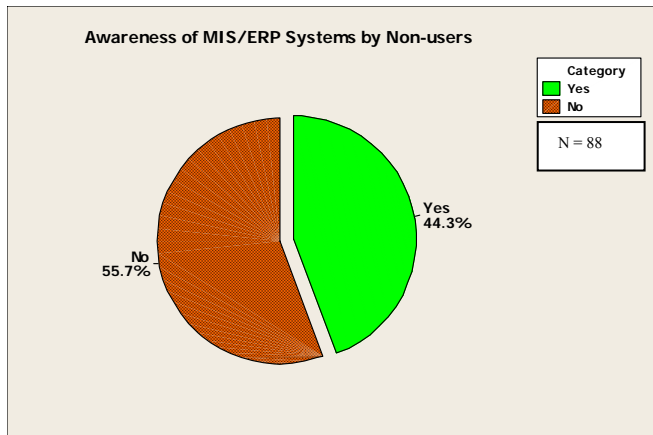


Figure K

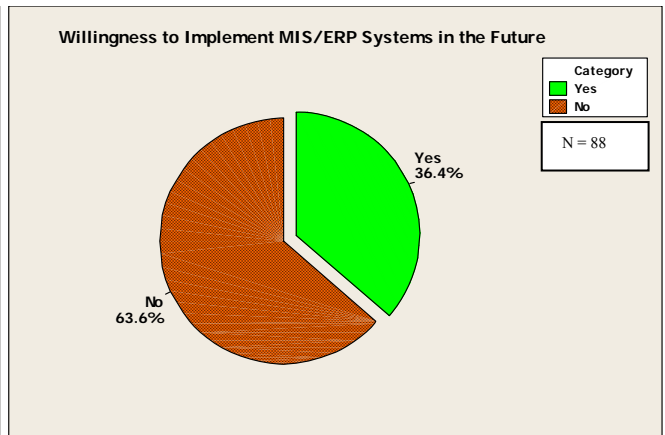


Figure L

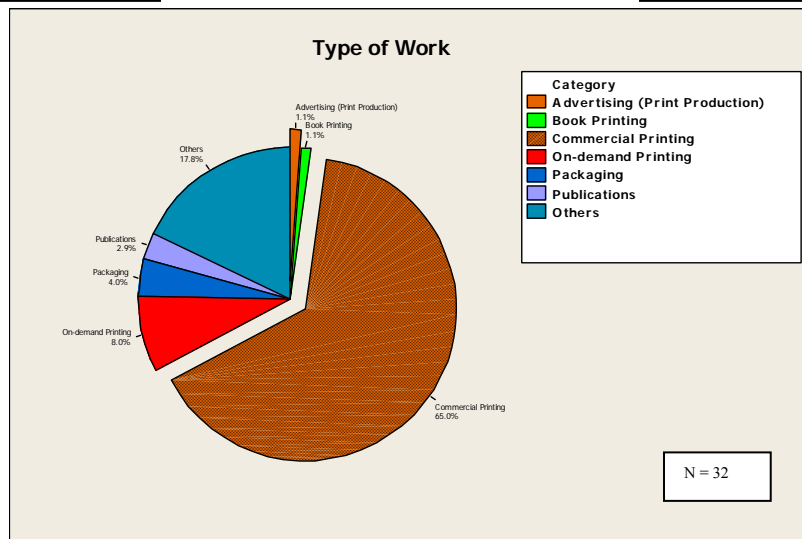


Figure M

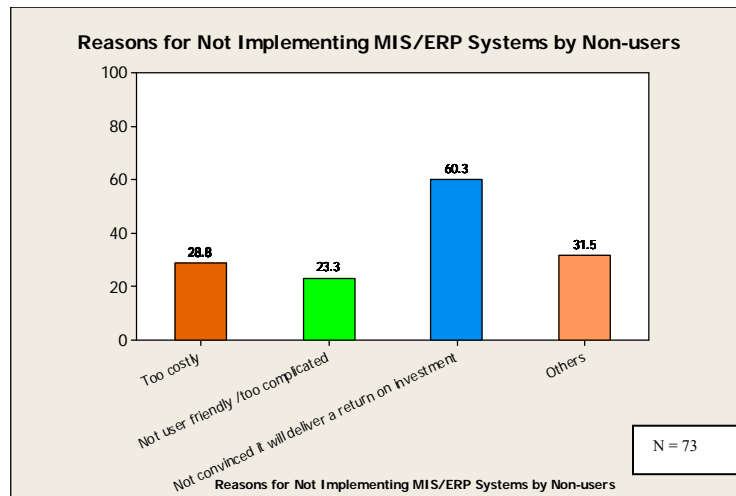


Figure N

For those non-users who planned to implement MIS/ERP, the majority (84.4%) planned to do so within two years, as reflected in **Figure M**. As depicted in **Figure N**, a majority of non-user respondents indicated an unwillingness to invest in MIS/ERP systems primarily because they are not convinced such an investment would deliver a reasonable return on investment. 87.4% reported that the systems were either too costly or did not carry a convincing ROI.

The telephone interviews uncovered other reasons for not adopting MIS/ERP systems in the print production area, including non-compelling pricing for these systems and a belief that the respondent's production process was streamlined enough that it didn't warrant adoption of such a system.

Key Finding 4—Access to real-time data and better business decision making are the primary benefits of MIS/ERP systems in the print production area. The primary problems with implementation revolve around staff training and consistent staff utilization.

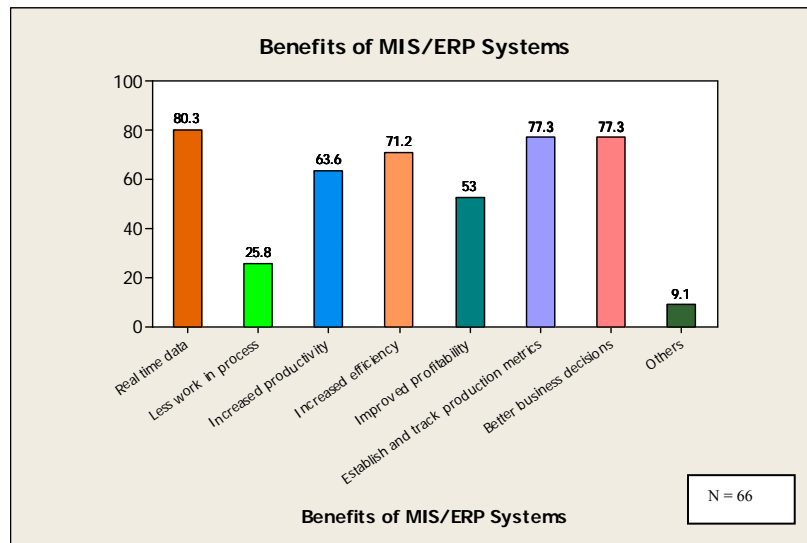


Figure O

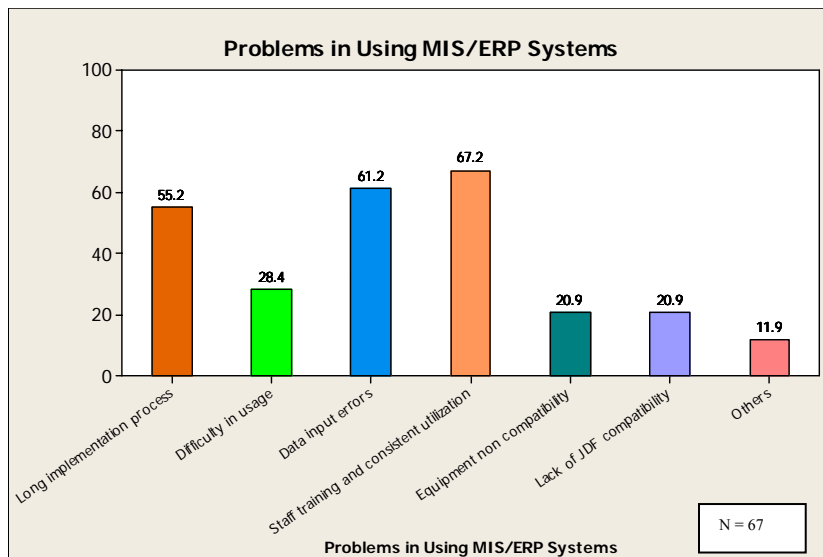


Figure P

According to the research, MIS/ERP systems have a range of benefits, among which the most prevalent are access to the real-time data, the ability to establish and track production metrics, and the

capability to make better business decisions. As seen in **Figure O**, 80.3% of the respondents consider access to real-time data as the most important benefit. Better business decisions and the ability to establish and track production metrics were both cited as benefits by 77.3% of respondents. Increased efficiency was also considered important by 71.2% of respondents.

Some of the problems respondents found in implementing MIS/ERP systems included:

- Staff training and consistent utilization of the system by staff (67.2%)
- Data input errors (61.2%)
- Long implementation process (55.2%)

Telephone interviews revealed other issues with MIS/ERP system implementation in the print production area, including:

- The data input errors were huge early in the implementation; 70% of the errors were attributed to the user interface and 30% were attributed to equipment failure.
- Where non-compatibility issues were experienced, these were primarily with legacy equipment and systems, although little non-compatibility was reported.

Conclusions and Recommendations

The research provided an insight into the use of MIS/ERP systems in print production areas of business establishments in the U.S. The execution of MIS/ERP systems in print production can help integrate pre-press, press and post-press. These systems provide the latest information, improve customer relations, and help align estimates to actual production.

A majority of MIS/ERP systems users who participated in this study apply this technology in print production areas. The non-users are not aware and/or do not understand the return on investment (ROI) delivered. As one can see from the information presented, the use of MIS/ERP systems in print production has demonstrated it can be an impetus for business growth. Print establishments that have not yet adopted these types of solutions need to better understand the benefits and consider the option of implementing these systems in their print production areas.

To accomplish this, the MIS/ERP solution providers should increase their efforts to reach these establishments and make them aware that there are solutions available to a wide variety of organizations irrespective of size or investment. Also, they should stress the development and/or improvement of offerings that are more production centric and easier to use.

Access to real-time data and better business decision-making are the primary benefits of MIS/ERP systems. The print establishments that have not yet adopted these technologies should be educated about their advantages and understand how the implementation of these types of solutions in print production could help in the enhancement of their businesses. The MIS/ERP systems providers should leverage these points in promoting their systems. The primary problems with implementation revolve around staff training and consistent staff utilization. These solutions need to be more user friendly, to have an automated data input where possible to avoid data input errors, and to identify ways to reduce inconsistent staff utilization.

A more detailed study about the reasons for not using these MIS/ERP systems needs to be conducted and analyzed for future research. Also, a follow-up study should be done in order to evaluate the implementation plans and changing needs of the non-users.

References

http://www.efi.com/documents/promo/abc/ABCs_of_PrintMIS.pdf

<http://en.wikipedia.org/wiki/>

Acknowledgments

The primary investigator would like to thank Ms. Cary Sherburne for serving as the liaison between The Electronic Document Systems Foundation and the research team. Ms. Sherburne participated in every stage of this research and made many efforts to improve the quality of this project. Additional appreciation is extended to Mr. Leland Morgan, Mr. Bob Kutschke, and Mr. Matt Johnson for review of survey questionnaires. Last but not least, we are grateful to all of the respondents who gave generously of their time to participate in this research.

About (EDSF) The Electronic Document Systems Foundation

EDSF (The Electronic Document Systems Foundation) is a charitable foundation dedicated to preparing the next generation of professionals for the industry. EDSF supports the industry's future by granting scholarships to students in support of their academic careers, by sponsoring a research grant/mentor program for colleges and universities, by building awareness about industry careers, and by recognizing innovative educators and educational programs. EDSF serves vendors, suppliers, and users who design and implement document solutions for business applications.

For more information about EDSF, please visit www.EDSF.org or phone (310) 265-5510.

About Pittsburg State University

Pittsburg State University (Kansas) is a multi-purpose state-supported university whose primary objective is to offer strong undergraduate and graduate educational programs to those in its service area. Sound higher education should enhance the best intellectual, social, and personal development of the university community. Moreover, it must provide professional and vocational training of high quality. The university is committed to the basic concepts of democracy and to the democratic processes in solving common problems at all levels of government and in all areas of contemporary society. The academic and activity programs of the university are designed to enrich and improve the state, national, and international cultural heritage; to assist all individuals to contribute to the common good of society by developing personal integrity and vocational competence; and to encourage the development of the individual's creative ability.

The Department of Graphics and Imaging Technology is one of the five departments within the College of Technology at Pittsburg State University. The Department offers the Bachelor of Applied Science with a major in Technology, Bachelor of Science in Technology with a major in Commercial Graphics and Graphic Communications Management. The Commercial Graphics major has emphasis that can be pursued in Design, Multimedia, Photography or Screen Printing. The Graphic Communications Management major offers emphasis in Management, Technology and Sales and Customer Services. Several Minors are available for those interested in this field, including the Graphic Art minor, Graphic Design minor, Multimedia minor and Photography minor. The Department also offers a Master of Science with a major in Technology and an emphasis in Printing Management and Graphics.

For more information about Pittsburg State University, please visit www.pittstate.edu/git or phone (620) 235-4420.

About the Research Team

Dr. Jesús J. Rodríguez is Professor and Chairman, Graphics and Imaging Technology, Pittsburg State University. He earned a Bachelor of Science degree in Printing Management from Sam Houston State University, Huntsville, Texas; a Master of Education in Adult Education and a Doctor of Philosophy



in Interdisciplinary Education from Texas A&M University. He has 30+ years of teaching experience, has been International President of the International Graphic Arts Education Association, chairman of the Graphic Communications Council and president of the Accreditation Council of Collegiate Graphic Communications.

Chaitanya Gogula is a May 2006 graduate with a Master of Science in Print Management and Engineering Technology at Pittsburg State University. He has completed his Bachelor of Engineering with a major in Printing Technology and Graphic Communications from Pune University, India. Before attending Pittsburg State University he worked as a Customer Service Manager at Kinnari Pad Printing Technologies Pvt. Ltd. in Mumbai, India for two and half years, involved in sales and customer service of pad printing machines.

Hrishikesh M. Kharalkar is a May 2006 graduate with a Master of Science in Print Management at Pittsburg State University. He has completed his Bachelor of Engineering with a major in Printing Technology and Graphic Communications from Pune University, India. Before attending Pittsburg State University he worked as an Assistant Manager Quality Control for two years, at Repro India Ltd. in Mumbai, India involved in magazine publication and commercial printing accredited to ISO 9001:2000.

Sushil Kumar is a May 2006 graduate with a Master of Science in Print Management at Pittsburg State University. He has completed his Bachelor in Technology with a major in Printing Technology from Jawaharlal Nehru Technological University College of Engineering, Hyderabad, India.

Appendix A: Stage I Survey Cover Letter and Survey Questionnaire

Survey Cover Letter

Subject: Current and Future use of MIS/ERP systems in Production Printing in the U.S.

Date: April 4, 2006

Greetings,

The Electronic Document Systems Foundation (EDSF) is sponsoring research to determine current and future use of MIS/ERP systems in production printing in the U.S. This study is being conducted by Pittsburg State University, Pittsburg, Kansas, with a team of researchers (faculty and students). We have identified your company as a source of valuable information relative to MIS/ERP systems, and we would appreciate your participation in this important research. The survey will take about five minutes of your time. You can participate in the Web-based survey by visiting:

<http://www.surveymonkey.com/s.asp?A=121838026E37514>

As a token of our appreciation for your participation in this important research, upon receipt of your completed questionnaire, we will enter your name in the drawing for a free “Pod shuffle (1Gb)” (assuming you provide us with your contact information at the end of the process).

Results from the study will be included in a report that will be published on the EDSF Web site (www.edsf.org).

We appreciate your participation. If you have further questions pertaining to the study, please do not hesitate to e-mail Dr. Jesús J. Rodríguez, Chairman and Coordinator, Department of Graphics and Imaging Technologies, Pittsburg State University, Pittsburg, Kansas at jrodrigu@pittstate.edu or call Dr. Jesús J. Rodríguez at (620)235-4420.

Additional information about MIS/ERP systems is included at the bottom of this e-mail.

Thank you,

Pittsburg State University Research Team.

For purposes of this survey, the following definitions apply:

Management Information System or MIS is an information system that integrates data from all the departments it serves and provides operations and management with the information they require and Enterprise Resource Planning, or ERP as the name suggests, is concerned with enterprise planning. ERP attempts to integrate all departments and functions across a company onto a single computer system that can serve all those different departments’ particular needs. It is a kind of system that serves the needs of people in finance as well as the people in human resources and in the warehouse among others. Each department has its own computer system optimized for particular ways that the department does its work. But MIS/ERP combines them all into single, integrated software application(s) that runs a single database so that the various departments can more easily share information and communicate. Management Information System/Enterprise Resource Planning can be a key element in the Printing and Graphic Arts Industries for their day-to-day activities.

Survey Questionnaire

Current and Future use of MIS/ERP Systems in Production Printing in the U.S.

Demographics

1. Location--State
2. Type of work
 - Advertising (Print Production)
 - Book Printing
 - Commercial Printing
 - On-Demand Printing
 - Packaging
 - Publications
 - Other
3. Number of employees
 - 1-4
 - 5-9
 - 10-19
 - 20-49
 - 50+
4. Total sales
 - \$2- 4.9 Million
 - \$5-14.9 Million
 - \$15-29.9 Million
 - \$30 Million or over

Qualifying Section

Please consider the next three questions carefully as they will determine which questions will be presented to you in the spirit of keeping the survey relevant.

1. Are you currently using an MIS/ERP solution in your company?
 - Yes
 - No (If no, go to Section B)
2. Is your MIS solution used in your **print production** area?
 - Yes
 - No (If no, go to Section B)
3. In which area(s) of production have MIS been implemented? (Select all that apply)
 - Prepress
 - Press
 - Post press

Section A

1. How long have you been using an MIS/ERP solution in print production?
 - 0-5 years
 - 6-10 years
 - More than 10 years
2. How would you characterize the overall investment cost for the MIS/ERP solution? (Equipment cost + Training cost + Software installation + Maintenance)
 - Low
 - Moderate
 - High
3. What is the return on investment you received/ expect to receive from your MIS/ERP implementation?
 - Immediate
 - Short term (5 years or less)
 - Long term (over 5 years)
4. Please characterize the reduction in manual operations/manpower you have experienced as a result of MIS/ERP implementation?
 - 0%-10%
 - 10%-20%
 - More than 20%
5. How would you characterize the impact your MIS/ERP solution has had on your ability to grow your business?
 - None
 - Limited
 - Moderate
 - Significant
 - Don't Know
6. Benefits (select all that apply)
 - Real Time Data
 - Less Work-In-Process
 - Increased productivity
 - Increased efficiency
 - Improved profitability
 - Ability to establish and track production metrics
 - Ability to make better business decisions
 - Any others _____
7. What problems have you had with your MIS/ERP implementation (select all that apply)
 - Long implementation process
 - Difficulty in usage
 - Data input errors
 - Staff training and consistent staff utilization
 - Non compatibility with the equipment
 - Lack of JDF compatibility



8. Please share any additional comments you have about the importance of Print MIS in your business, including any unexpected benefits

Section B

1. Are you aware of the availability of MIS/ERP solution for in the printing industry?
 - Yes
 - No
2. Do you plan to implement MIS/ERP in print production?
 - Yes
 - No (If no, go to question 4.)
3. If Yes, when?
 - 0-2 years
 - 2-5 years
 - More than 5 years
4. If No, do you plan to invest in other new technologies?
 - Yes, then what are those _____
 - No
5. What are reasons for not implementing an MIS/ERP solution?
 - Too costly
 - Not user friendly /too complicated
 - Not convinced it will deliver a return on investment
 - Other _____
6. Please share any additional comments you have about Print MIS as it relates to your business

Appendix B: Stage II Survey Cover Letter and Survey Questionnaire

Survey Cover Letter

Subject: Current and Future use of MIS/ERP systems in Production Printing in the U.S.

Date: April 18, 2006

Greetings,

Thank you for taking the time to respond to the EDSF/Pittsburg State University research on the state of MIS/ERP in the printing industry, and for agreeing to allow us to follow up with you. We have included the questions which focuses further on the research through a Survey Link below. Of course, any additional information you can share about your experiences with MIS/ERP will be most welcome. We may even call you for any further interview, if required.

The survey will take about seven minutes of your time. You can participate in the Web-based survey by visiting:

<http://www.surveymonkey.com/s.asp?A=125243328E10337>

As a token of our appreciation for your participation in this important research, upon receipt of your earlier completed questionnaire, we have entered your name in the drawing for a free “iPod shuffle (1Gb)”.

Results from the study will be included in a report that will be published on the EDSF Web site (www.edsf.org).

We appreciate your participation. If you have further questions pertaining to the study, please do not hesitate to e-mail Dr. Jesús J. Rodríguez, Chairman and Coordinator, Department of Graphics and Imaging Technologies, Pittsburg State University, Pittsburg, Kansas at jrodrigu@pittstate.edu or call Dr. Jesús Rodríguez at (620)235-4420.

Additional information about MIS/ERP system is included at the bottom of this e-mail.

Thank you.

Pittsburg State University Research Team.

For purposes of this survey, the following definitions apply:

Management Information System or MIS is an information system that integrates data from all the departments it serves and provides operations and management with the information they require and Enterprise Resource Planning, or ERP as the name suggests, is concerned with enterprise planning. ERP attempts to integrate all departments and functions across a company onto a single computer system that can serve all those different departments’ particular needs. It is a kind of system that serves the needs of people in finance as well as the people in human resources and in the warehouse among others. Each department has its own computer system optimized for particular ways that the department does its work. But MIS/ERP combines them all into a single, integrated software application(s) that runs a single database so that the various departments can more easily share information and communicate. Management Information System/Enterprise Resource Planning can be a key element in the Printing and Graphic Arts Industries for their day-to-day activities.

Survey Questionnaire

Current and Future use of MIS/ERP Systems in Production Printing in the U.S.

Users

- 1) How long was the implementation period for your MIS/ERP systems? How much customization was necessary?
- 2) What kind of support did you or did you not received form the MIS/ERP systems provider?
- 3) Can you quantify your MIS/ERP systems maintenance cost and staff requirement as a percentage of your total work force?
- 4) What were your expectations for return on investments before implementing the MIS/ERP system? And what is your actual ROI after implementation?
- 5) Can you share your views about non-compatibility of the MIS/ERP system with current equipment you are using?
- 6) How would you describe the data input errors in the use of MIS/ERP system?
- 7) What would you characterize as the biggest difference in your business before and after implementation of your MIS/ERP?

Non-users

- 1) Are you aware of the benefits of MIS/ERP system?
- 2) Have you talked to peers who have implemented MIS/ERP? If so, what kind of feedback are you getting from them and how important is that in your evaluation process?
- 3) Can you quantify the return on investments which you would expect if you were implementing MIS/ERP system in your firm?
- 4) What kind of support would you expect to receive from MIS/ERP system providers?
- 5) What level of investment would you be willing to make in an MIS/ERP solution
- 6) What would have to change either in your business or the capabilities and/or price point of MIS/ERP solutions for you to consider investing in MIS/ERP?



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