

8-25-1995

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Recommended Citation

Bhatt, Ganesh D., "Enterprise Information Systems Integration and Business Process Improvement Initiative: An Empirical Study" (1995). *AMCIS 1995 Proceedings*. 81.
<http://aisel.aisnet.org/amcis1995/81>

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Enterprise Information Systems Integration and Business Process Improvement Initiative: An Empirical Study

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INTRODUCTION

Since the mid-and late 80's, business process improvement (BPI) has become one of the leading methodologies to deliver corporations with high quality products and services. Businesses are seeking not simply to automate existing operations, but to improve and redesign business processes and capture customers' expectations for products, and service delivery.

Extensive communication and inter-connectivity arising from adoption of standards and integrated services digital networks (ISDN) has become a major force affecting businesses in fundamental ways (Madnick, 1990; Boar, 1993). The second avenue through which businesses are identifying new opportunities is the availability of databases (Madnick, 1990).

By linking inter-organizational, inter-functional, and inter-personal levels of the processes through IS networks, businesses are not only automating their activities, they are also reshaping and improving their business processes (Hammer and Champy, 1993). By accessing enterprise-wise information from databases, IS integration is providing numerous opportunities to coordinate organizational activities by facilitating communication and information exchange across departments without the need to go up and down the vertical chain of command.

The use of information networks to access relevant information from databases has been of enormous importance to eliminate duplicate activities, prevent errors from occurring, cycle time reduction in product development, and customer responsiveness (Davenport, 1993).

The need of a well planned database management system is one of the important requirements for BPI. In most organizations, data architecture has evolved as a result of applications databases in various departments rather than as a well planned data management strategy. Therefore, the resolution of data management problems becomes quite difficult (Goodhue, Quillard, and Rockart, 1988).

The access to timely, accurate and consistent information is crucial in business process improvement. IS integration, through communication networks and database systems, enables organizations to create and sustain process improvement through timely retrieval

of consistent and accurate information. Process improvement can be measured by the extent desired specified results are produced right the first time (i.e., outcomes with zero defect), the extent various processes minimize the consumption of the business resources, and the extent business processes are easily modified to meet or exceed customers' expectations for products and service delivery.

The current study is aimed at developing and empirically testing the relationships between IS integration and BPI. As presently there are only a handful studies that empirically test the relationship between information systems and BPI, this study is an important step for furthering the scope of present stage of the IS literature.

THE PRESENT STUDY

This study is being built on a socio-technical theoretical foundation, which has been only partially addressed in the literature by Davenport (1993). Through an in-depth scanning of relevant literature, for IS integration three variables (i.e., data integration; network connectivity, and flexibility); and for BPI seven variables (i.e., top management role, work-group empowerment, defect prevention, improvement action, cost, product development to meet or exceed customers' expectation, and customer responsiveness) have been identified. Hypotheses linking IS integration and BPI have been developed.

Pilot testing for establishing the face validity of the proposed measuring instrument will be carried out in consultation with ten divisional managers chosen randomly from "Manufacturers' News Incorporated" and "Business Service Directory" lists followed by data collection. The study will then empirically test the hypothesized propositions between IS integration and BPI.

The objective of the study is to address the following broad question: Does enterprise information systems integration affect business process improvement?

Enterprise Information systems integration

Enterprise information systems integration is defined as the extent various information systems are formally linked for the sharing of consistent information within an enterprise.

Enterprise information systems integration is conceptualized along two dimensions: 1) data integration, and 2) enterprise communication networking (Madnick, 1990). Enterprise communication networking has been represented along two dimensions: connectivity, and flexibility. The scope of this study is limited to corporate data base networks, CAD/CAM, group support systems, and EDI.

Business Process Improvement

Business process improvement is an ongoing systematic effort to designing business processes to conform to requirements (Crosby, 1978).

The main objective of BPI is to make processes effective, efficient, and flexible. Effectiveness of a process is measured by the extent desired specified results are produced right the first time (i.e. outcomes with zero defects). Efficiency of a process is measured by the extent various business processes minimize the consumption of the business resources (Juran, 1992). The flexibility of a process is measured by the extent business processes are easily modified to meet or exceed customers' expectations for products and service delivery.

The ability to meet the above objectives depends upon the following criteria:

- 1) Does the process add any value in the final outcome?
- 2) Can the process time be reduced?
- 3) Can the activities be performed concurrently instead of sequentially?

DATA COLLECTION AND ANALYSES

In this study, a two-phase methodology will be employed for investigating the effect of IS integration on BPI. The two-phase methodology is useful to refine and validate the proposed empirical measures of IS integration (i.e. data integration; networking connectivity, and flexibility) and BPI (i.e., top management role, empowerment, error prevention, improvement action, cost, product development to meet or exceed customer demands, and customer responsiveness).

Pilot testing to establish the face validity of the instrument will be carried out in consultation with academicians and divisional managers for critically evaluating the comprehensiveness of the questionnaire.

In the second phase of the study, a random set of 1500 manufacturing and service firms from "Fortune 5000 MasterFile" will be contacted for gathering data and empirical verification of the model.

In terms of data collection, response bias will be ascertained statistically and relevant multivariate techniques will be employed to test the hypotheses linking IS integration and BPI.

CONTRIBUTION OF THE STUDY

Despite the current interest in BPI, a comprehensive theory on BPI is lacking. By pulling literature from Strategy and Policy, Organizational Behavior, Manufacturing and Information Systems disciplines, a comprehensive model to integrate technical and social perspectives of an organization will be developed.

The results of the study will have strong implications for both managers and researchers. Managers can be guided by a better understanding of the effect of enterprise IS

integration on BPI. Researchers can find our approach of comprehensive theory building an important step, as presently we lack a comprehensive theory of BPI, let alone the effect of enterprise IS integration on BPI.

To practicing managers, the study will provide important guidelines. There are several case studies that highlight the importance of IS integration on BPI (Davenport, 1993; Hammer and Champy, 1993), yet we lack empirical validation of the models. By analyzing the proposed models, we hope to provide a better understanding of IS integration and its impact on BPI.

REFERENCES

Available upon request.