



ACHIEVING AN INTEGRATED DATA ENVIRONMENT: A STRATEGIC INITIATIVE

The purpose of this publication is to make available to industry the results of research conducted by the Construction Industry Institute (CII). The publication does not necessarily represent the views of CII member companies, but is offered as a contribution to the industry.

CII was founded in 1983 to improve the cost effectiveness of the nation's largest industry. The members, who represent a broad cross-section of owners and contractors, believe that many of the problems that limit cost effectiveness are common ones, and that real improvements can be best accomplished in a cooperative environment with the benefits being shared by the construction industry at large.

CII uses the acronym TOPICS to describe the research effort. TOPICS signifies the six research thrust areas: Technology, Organization, People, Information, Controls, and Sigma (meaning others). The current task forces for each area are listed below.

Technology

- Advanced Technological Systems
- Computer Integrated Design & Construction
- Design for Safety
- Environmental Remediation Technology
- Technology Strategy
- Technology Survey

Organization

- Partnering II
- Project Change Management
- Pre-Project Planning
- Project Organization II
- Project Team Building

People

- ADA Impacts
- Continuing Supervisory Education
- Drug-Free Workplace
- Multi-Skilling
- Zero Accidents

Information

- 3D CAD Link
- International Construction
- International Standards
- Owner Engineering Organization
- Project Team Communications

Controls

- Change Order Impacts
- Contracting, Phase II
- Dispute Prevention and Resolution
- International Standards
- Predictive Tools
- Quality Performance Measurement
- Schedule Reduction
- Total Quality Management

Sigma

- Barriers to Implementation
- Insurance
- Piping Function
- Retrofit Projects
- U.S. Navy Demonstration Project
- Utility Pilot Projects
- Workers Compensation

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Achieving An Integrated Data Environment: A Strategic Initiative

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Electronic Data Management Task Force**

**Publication 20-3
February 1993**

Reviewed by CII 23Jun04

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The University of Texas at Austin.

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Printed in the United States of America.

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Executive Summary

During the past decade the construction industry has witnessed dramatic improvements in electronic data generation and management.

The industry recognizes that these improvements offer opportunity for enhanced performance and competitiveness. Thus, companies acting individually or with key customers are pursuing electronic data management opportunities that offer immediate payback. As a result, many successful examples exist of CAD drawing utilization and transfer, electronic purchasing, and related applications. This has resulted in the creation of “islands of automation.” These islands continue to be linked, however, by low technology bridges such as facsimile and paper documents.

The full benefit of electronic data management will not be attained until the low technology bridges are eliminated and industry work practices are modified to fully exploit the technology. When this occurs throughout the entire industry, the integrated data environment will have arrived.

The industry doubtlessly will achieve the integrated data environment. Questions do remain, however, about whether it will be achieved at a timely pace and in a fashion that is compatible with industry needs. This publication describes the barriers that threaten to limit the pace and effectiveness of the industry's drive towards the integrated data environment. It also presents a series of pragmatic recommendations for individual companies and the industry as a whole to remove these barriers. The effectiveness with which the industry implements these recommendations will impact its future competitiveness and growth.

CII Publication 20-1, *EDI: Concepts and Applications*, and CII Publication 20-2, *An Introduction to Integrated Database Systems*, are companion reports to this document.

Introduction

During the past decade, the construction industry has witnessed a dramatic transformation in electronic data generation and management. The transition from single main frame computers to multitudes of mini and microcomputers has significantly altered the manner and means by which owners and contractors generate and manage construction-related data.

Rapidly improving technology coupled with declining hardware costs have permitted a distributed and decentralized processing that provides even the smallest project the benefits of electronic data management. Further, advancements in technology and software development now afford virtually every phase and facet of the construction project the benefits of computerization, including design, drafting and specification writing; estimating and quantity survey; procurement and materials management; scheduling; quality management; and payroll, accounting, and project controls.

These developments have resulted in a phenomenal growth in the volume and variety of data as well as the number of locations, entities and applications generating, processing, and utilizing that data. With this growth, the ability to accurately and efficiently collect, input, process, display and utilize information and then transfer, access, and share that information between and among various organizations, locations, and applications in an integrated manner has become essential. The achievement of this ability, referred to as an "integrated data environment," has been a major focus of the CII Electronic Data Management Task Force research efforts.

The task force has identified two essential and related components that contribute to an integrated data environment. The first is the concept of an integrated database (IDB); the second is a powerful technology known as electronic data interchange (EDI). Both components are explored more fully in the other CII Publications issued by the task force. The purpose of this document is to outline the actions that must be taken by management on both company and industry levels to achieve an integrated data environment in the construction industry in a timely and effective manner.