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A Guide to Successful Implementation

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Virtual Teams

A Guide to Successful Implementation

Prepared by
The Construction Industry Institute
Making Virtual Teams Work Project Team

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Executive Summary

The construction industry needs a way for project teams to electronically collaborate. With projects spread across the globe and with various geographic locations specializing in one or more aspect of a multi-layered project, the challenge is to gather and exchange information in an accurate and timely fashion while leveraging as much technology as possible. The emergence of the “virtual team,” an electronic assemblage of people in various locations who have the common project goal of success, provides the industry with opportunities, challenges, and a few barriers, all of which need to be addressed.

Virtual teams are getting increasing attention in the design and construction communities. From opportunities to integrate international teams to leveraging the best resources, companies are turning to the idea of virtual teams to transform project execution. Problems, however, range from management aspects to the social and cultural implications to rapidly advancing technology. An overemphasis on one can affect the others. Challenges such as security, systems compatibility, and appropriate technologies combine with non-technical factors and introduce complications into an already complicated project process.

CII created the Making Virtual Teams Work Project Team to study the challenges and to provide recommendations. The project team believes that virtual teaming will be standard business practice within the next five years. The construction industry must be prepared. The following pages provide a path forward to understanding the unique issues associated with virtual teams.

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Introduction

As companies and projects increasingly utilize multi-national and multi-organizational partnerships, the need for greater and more efficient communication alternatives is also increasing. However, little guidance currently exists to assist an organization in the successful implementation and management of an electronic collaboration solution — a virtual team. In an effort to fill this information gap, the CII Making Virtual Teams Work Project Team (PT 170) was formed to study the topic. The scope of this effort included the examination of current research, virtual team practices within the industry, and cases outside the EPC industry.

The immediate issue that organizations discover when approaching the topic of virtual teams is defining what virtual teaming encompasses. Organizations and researchers have various definitions for the concept of virtual teaming. Therefore, to assist CII members in pursuing this topic, PT 170 developed the following virtual team definition:

A *virtual team* is a group of people with complementary competencies executing simultaneous, collaborative work processes through electronic media without regard to geographic location.

The important concept in this definition is that virtual teams do not refer to traditional work sharing, electronic communications, or other forms of dividing projects that require individuals or groups to work independently. Rather, virtual teams allow individuals or groups to collaborate on a project in real-time through electronic media. In this manner, the virtual team operates as an integrated team whose members may be located in various places. The

potential advantages of this type of collaboration are numerous, including:

- Efficiency of project execution
- Removal of physical boundaries
- The integration and optimization of competencies
- The ability to form new partnerships.

The majority of CII members believe that virtual teams will be a primary mode of project execution within five years. The construction industry in general and CII companies specifically, however, have not studied the full spectrum of issues associated with implementing virtual teams. Management issues such as reinforcing a “team” feeling, establishing trust, and selecting team leaders have received little attention, while technology issues such as security, compatibility, and training remain as perceived barriers to implementing virtual team technology.

Although these management issues are a primary concern for any organization examining the use of virtual teams, technology issues should not be forgotten. Technology is no longer a limiting factor for implementing virtual teams, but poor technology choices can defeat the implementation and operation of a virtual team. Such technology issues must be addressed in the context of an individual organization and the projects to be undertaken in a virtual team environment.

Data Collection

The development of the virtual team management and technical guidelines presented in this document focused on a combination of several data collection techniques. First, extensive literature reviews were conducted to develop a context of virtual teaming for the construction industry. Specifically, the development of virtual teaming, the current use of virtual teaming, and the ramifications of the technology were examined to produce a foundation on which to

study current virtual team implementations within the industry. Once this foundation was developed, the project team surveyed the CII membership to obtain an accurate picture of virtual team practices within the construction industry at the current time and for the near-term future. Finally, interviews were conducted with CII members, outside industries, and technology providers to obtain initial lessons-learned for successful virtual team implementation.

Guide Reference

This guide summarizes one path to virtual team success. Designed to assist an organization in navigating these issues, the guide represents a summary of the findings produced by CII Project Team 170.

In the subsequent pages, the following sections are presented:

- Context – A definition of virtual teaming and an introduction to the opportunities, risks, barriers, and benefits surrounding the virtual team concept.
- Management Issues – The key management considerations required for the successful implementation and management of a virtual team environment.
- Technology Issues – A summary of the technology concerns that can enhance or defeat the implementation of a virtual team.
- Trust – An overview of the trust, communication, and team building that are vital to successful virtual teams.
- Case Studies – Brief overviews of the use of virtual teaming at The Boeing Company and NASA and what lessons can be extracted for the EPC industry. This section also includes key information gathered from the virtual team survey conducted by PT 170.
- A Primary Checklist – The five key areas for virtual team success and for enhancing the opportunity to achieve this success.

Context

The decision to introduce virtual teaming into an EPC organization appears on the surface to be insignificant. The technology appears ready and the project team has previously demonstrated an above-average ability to coordinate and produce solutions within the given constraints. However, a larger set of considerations must be made prior to implementing a virtual team environment. Specifically, the decision to incorporate virtual teams should not be made without an understanding of the potential impact, opportunities, risks, and barriers that are associated with this form of operation.

Impact

The EPC community has been working toward a virtual project execution environment for a number of years. Early approaches utilized Low Cost Engineering Centers (LCEC). This effort entailed performing the initial engineering and preliminary design in a centralized domestic engineering office, and subsequently transferring the entire design package to a LCEC for execution of the detailed engineering and design. The primary purpose of this effort was to reduce the cost of the engineering component of project execution. This work splitting effort has gradually been moving toward a work sharing effort whereby the design has an element of interaction, but the concept of teaming is still not a reality on these projects.

The impact of the virtual team concept on the EPC community is the ability to move beyond the work-sharing concept, and develop a true interactive arrangement with all project participants. This shift in the execution model for both owner and EPC organizations will fundamentally alter the way that EPC projects are executed. In a very short period of time, this technology will