

The Cost of Inadequate Interoperability

The capital facilities industry is highly fragmented
Each facility has stakeholders that including architects, engineers, general contractors, suppliers, and owners and operators.

This fragmentation leads to **data interoperability problems**

Data interoperability. def.

The ability to manage & communicate electronic product & project data between collaborating firms & within individual companies design, construction, maintenance, & business process systems.

1-2%

This figure represents between 1 – 2 percent of industry revenue (Although it is likely that this is higher)

In 2002 annual data interoperability costs for the U.S. capital facilities industry were estimated at \$15.8 billion.

Data Interoperability issues are further compounded further by the number of companies who do not use advanced information technologies.

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Two thirds of these costs were borne by owners & operators

and occurred during ongoing facility operation & maintenance.

\$15,824 billion

The Costs of Inadequate Data Interoperability
by Stakeholder Group & Life Cycle Phase (in \$Millions)



Stakeholder Group	Planning, Design & Engineering Phase	Construction Phase	Operations & Maintenance Phase	Total
Architects & Engineers	1,007.2	147.0	15.7	1,169.8
General Contractors	485.9	1,265.3	15.7	1801.6
Specialty Fabricators & Suppliers	442.4	1,762.2	50.4	2204.6
Owners & Operators	722.8	898.0	-	10,648.0
Total	2,658.3	4,072.4	9,093.3	15,824.0

The O&M phase has higher cost associated with it than any other life cycle, and **Owners & Operators incur most the majority of these costs.**

Who are the Owners & Operators?

Any corporation or institute that owns, maintains, and/or operates a capital facility (commercial facilities, institutional facilities, industrial facilities) is considered an owner & operator.

Facility Life Cycle Phases

1. Planning & Design
2. Construction & Commissioning
3. Operations & Use (Including Maintenance)
4. Decommission & Disposal

Owners & operators believe that the **development and implementation of better tools** (information technology software & improved communication between stakeholders) are ways to improve construction productivity.



Phases 1 & 2 may take 2-5 years in a life cycle & 30-40% of the total life cycle costs are incurred here.



Phase 3 incurs 60-70% of total life cycle costs

The construction industry still widely uses paper as a medium to capture & exchange data among project participants.



Inability to communicate between stakeholders creates an estimated **30% waste of the total cost** of each building project.

There are usually **more than 200 requests** for information during a typical project.

Design, construction, operations, and maintenance engineers spend **40-60%** of their time looking for information.

What would reduce the costs of data interoperability?

Seamless Electronic Data Exchange, Management, and Access.

- Data would be entered into electronic systems ONCE and made available to ALL stakeholders instantaneously.

BIM is an initiative created to improve interoperability

BIM uses 3d modeling & digital simulations to rehearse all stages of the design, build, and operation process. BIM has been linked to a 20% efficiency stretch by the Government Construction Strategy.

The benefits of adopting online collaboration tools:

- Improved project progress communication
- Reduced response time
- Shortened time to completion
- Increased ownership of the construction process by owners and operators and accountability for contractors
- Improved record keeping and documentation.

* Research and stats taken from The U.S. Department of Commerce Technology Administration – National Institute of Standards & Technology's *Cost Analysis of Inadequate Interoperability in the U.S. Capital Facilities Industry.*

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