

INDEPENDENT PROJECT ANALYSIS, INC.



*43rd Annual IPLOCA Convention
San Francisco, CA*

In Search of Excellence in Pipeline Projects

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September 17th, 2009



IPA's Vantage Point on the Industry

- **IPA's business is the evaluation of capital projects, including pipelines, for the capital intensive industries around the world**
- **In a typical year, we evaluate about 800 major projects, including about 100 pipeline/distribution projects, both on-shore and marine**
- **We evaluate these projects once or twice as part of the owners' preparation process prior to sanction and again at completion**
- **We also use the huge data resource to research which practices improve (or injure) project results**

Elements of Capital Effectiveness

Key Leading Indicators

Solid Basic Data

Team Integration and Alignment

Front-End Loading

Execution Discipline

Team Continuity

Executed with Minimum Change

Project Controls

Key Performance Indicators

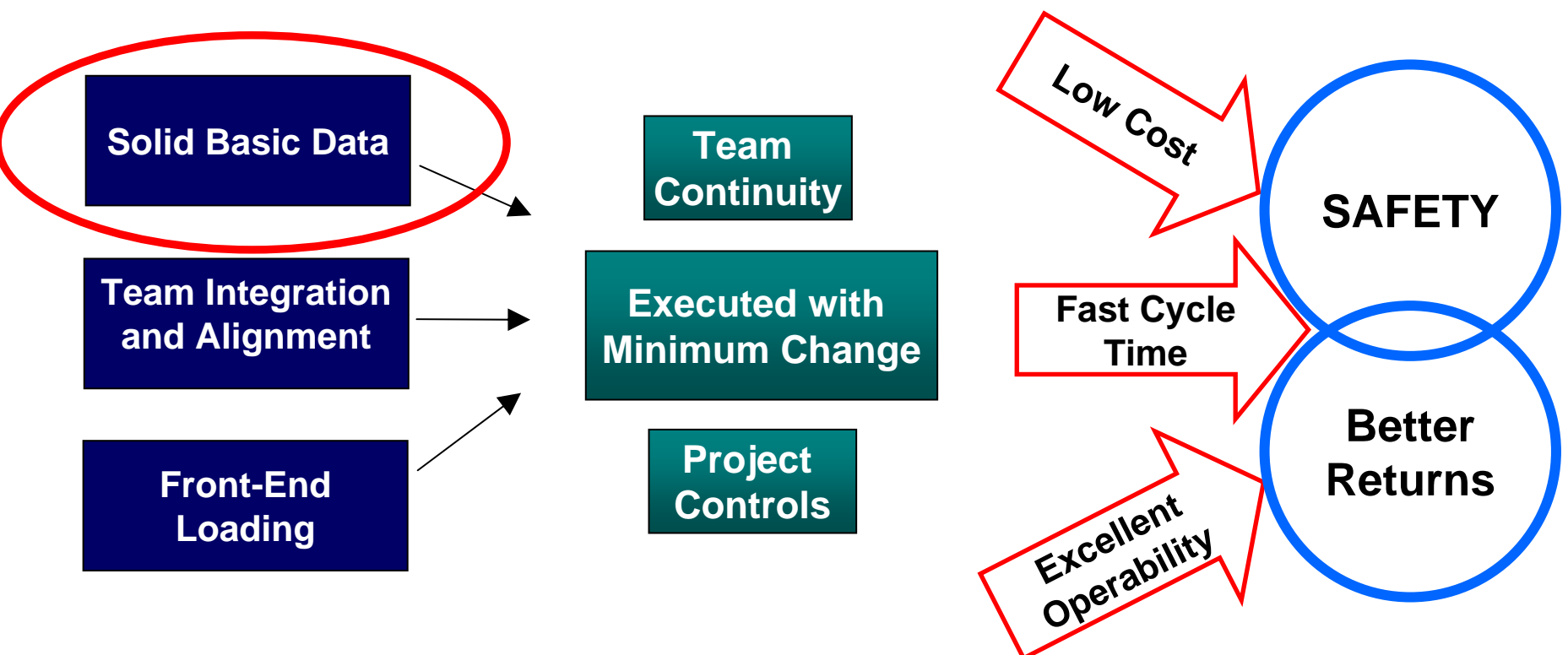
Low Cost

Fast Cycle Time

Excellent Operability

SAFETY

Better Returns





Developing Basic Data

Pipeline Examples

- Rheology and fluid/gas characteristics (including unusual characteristics such as sour service, high viscosity, high CO₂)
- Soil conditions/terrain/terrain stability (*Onshore pipeline*)
- Characteristics of onshore crossings known (e.g., river, road, rail, wetland)
- Early ROW issues identified
- Burial/trenching requirements
- Hydraulic analysis
- Early economic analysis
- Early identification of route instabilities
- Water depth and subsea terrain stability (*Offshore pipeline*)
- Basic line log (historical) information for existing lines
- Early identification of potential community issues (e.g., fishery, shipping)



The Basic Data are Basic!

- **Every project starts with the basic data—the information that will govern the overall design of the project**
 - **The basic data reflects the science underpinning the project**
 - **The basic data package is either provided to the core team or it is the first task of the team to develop it**
- **If the basic data are wrong, the project will suffer**
 - **Major changes will be made later or the facilities will fail to function as intended and may not be safe**
- **Most owners lack a Basic Data Protocol that would prevent them from missing major elements**

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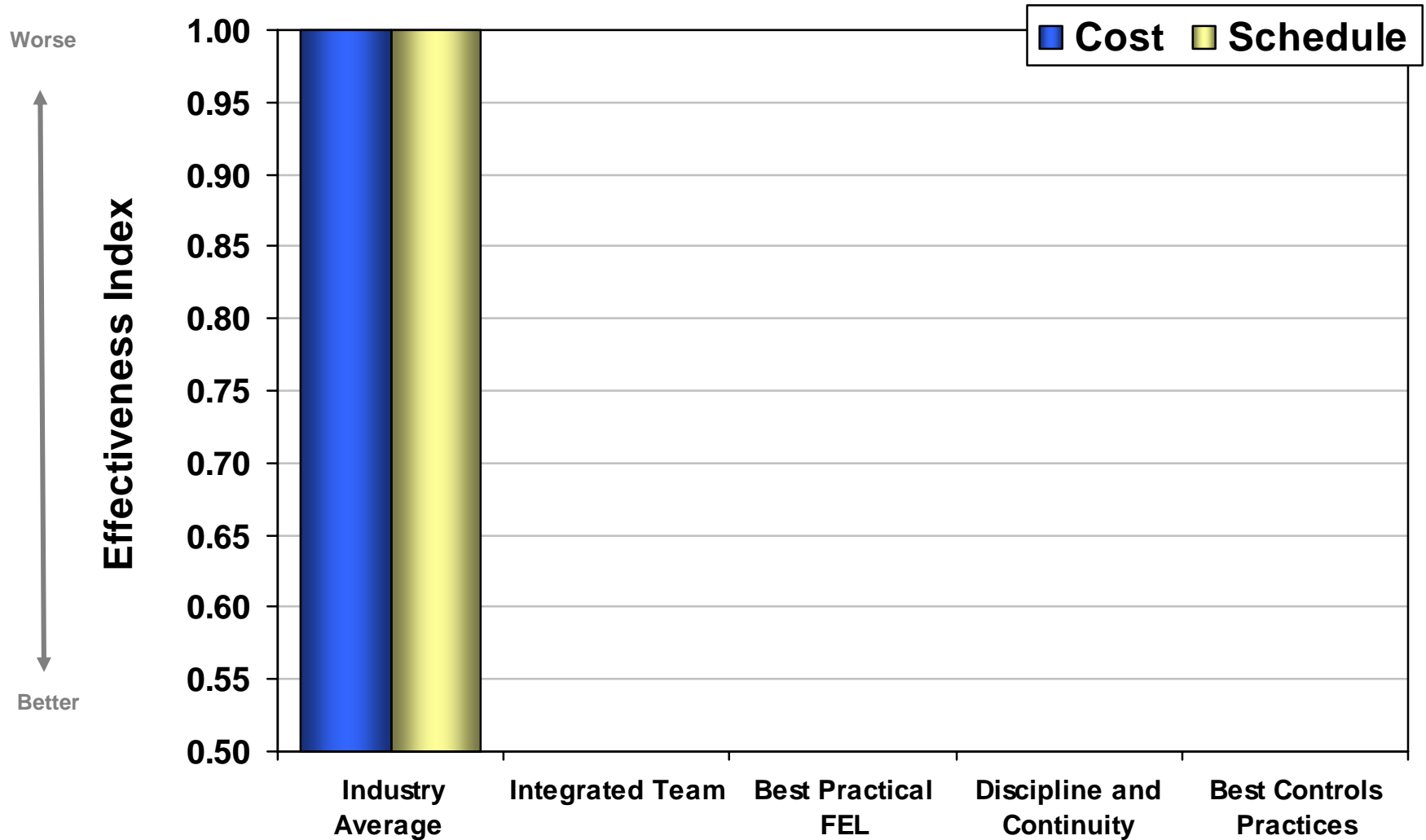
Better Returns



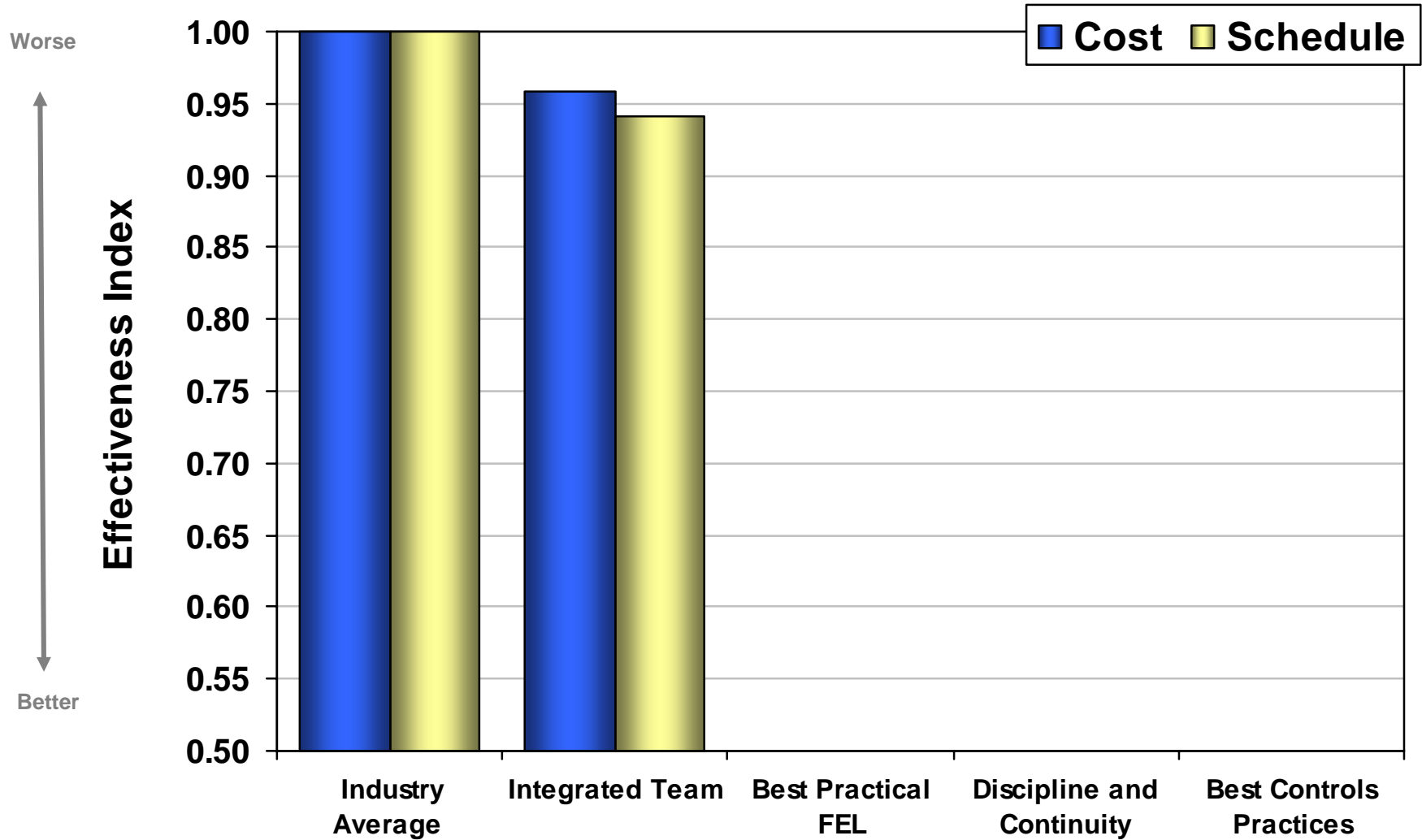
What Is an Integrated Project Team?

- A team of full- or part-time representatives from the following areas (team representation is not limited to these areas):
 - Business ● Engineering ● Construction ● Maintenance
 - Operations ● Health and Safety ● Project Controls
 - ROW/Community Affairs ● Environmental ● Contractor
- Representatives are identified before project authorization, and have specific responsibilities that are defined and understood by all team members
- Representatives have the authority to make decisions for the function they are representing and to provide functional input to the project manager

Drivers of Performance for Pipeline Projects



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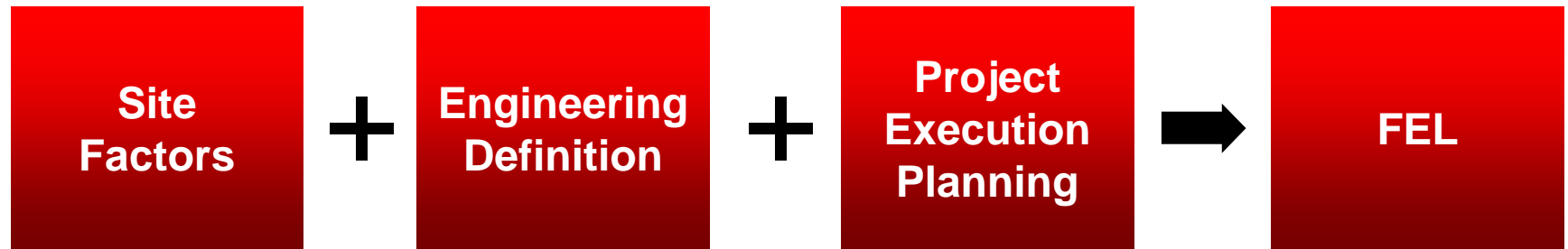
What Is Front-End Loading?

- Front-End loading (FEL) is process by which company develops detailed definition of capital project to meet business objectives
- Through process, capital productivity best practices are used, and profitability of company is enhanced
- During FEL questions are answered:

Why? What? When? How? Where? Who?

- IPA measures FEL at authorization (full funding)

Components of Pipeline Front-End Loading



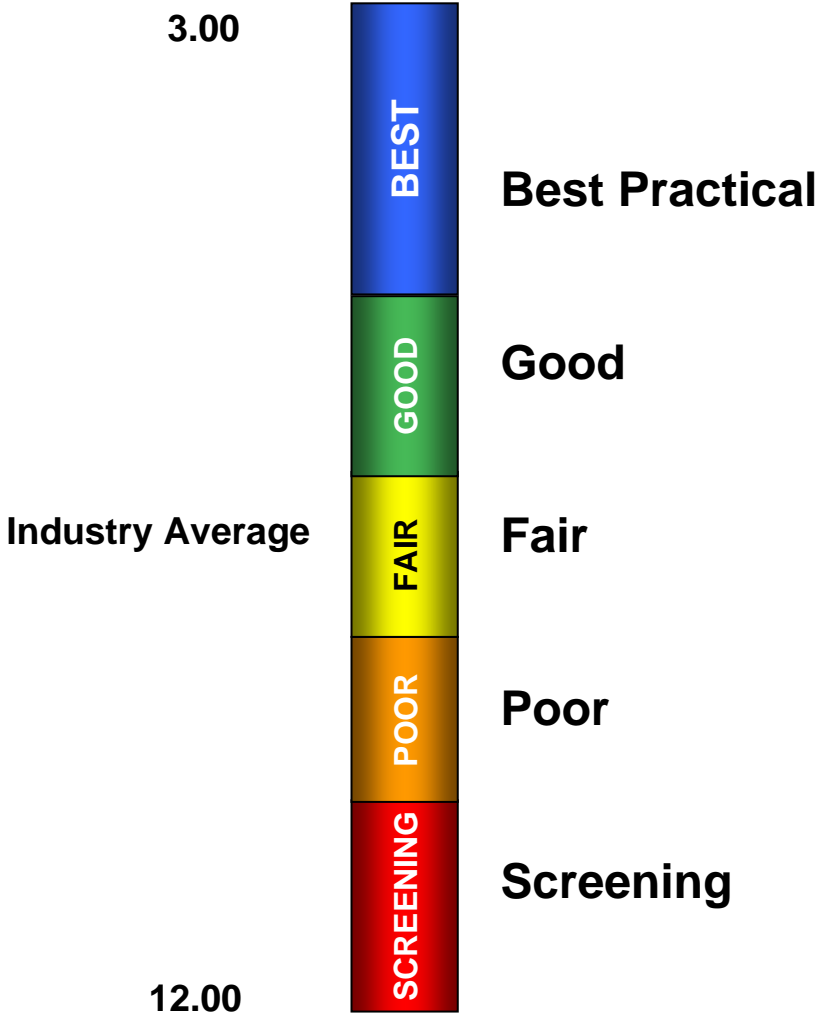
- Route Definition
- Soil Conditions/Terrain
- Environmental requirements
- Health & Safety requirements
- Right-of-ways
- Community Issues

- Engineering tasks
 - Detailed scope
 - Fluid/gas characteristics
 - Pipe properties
 - Hydraulic analysis
 - Burial/trenching requirements
 - Installation method
 - Directional drill requirements
 - Welding/inspection requirements
 - Cost estimate
- Participation/buy-in of:
 - Operations
 - Maintenance
 - Business

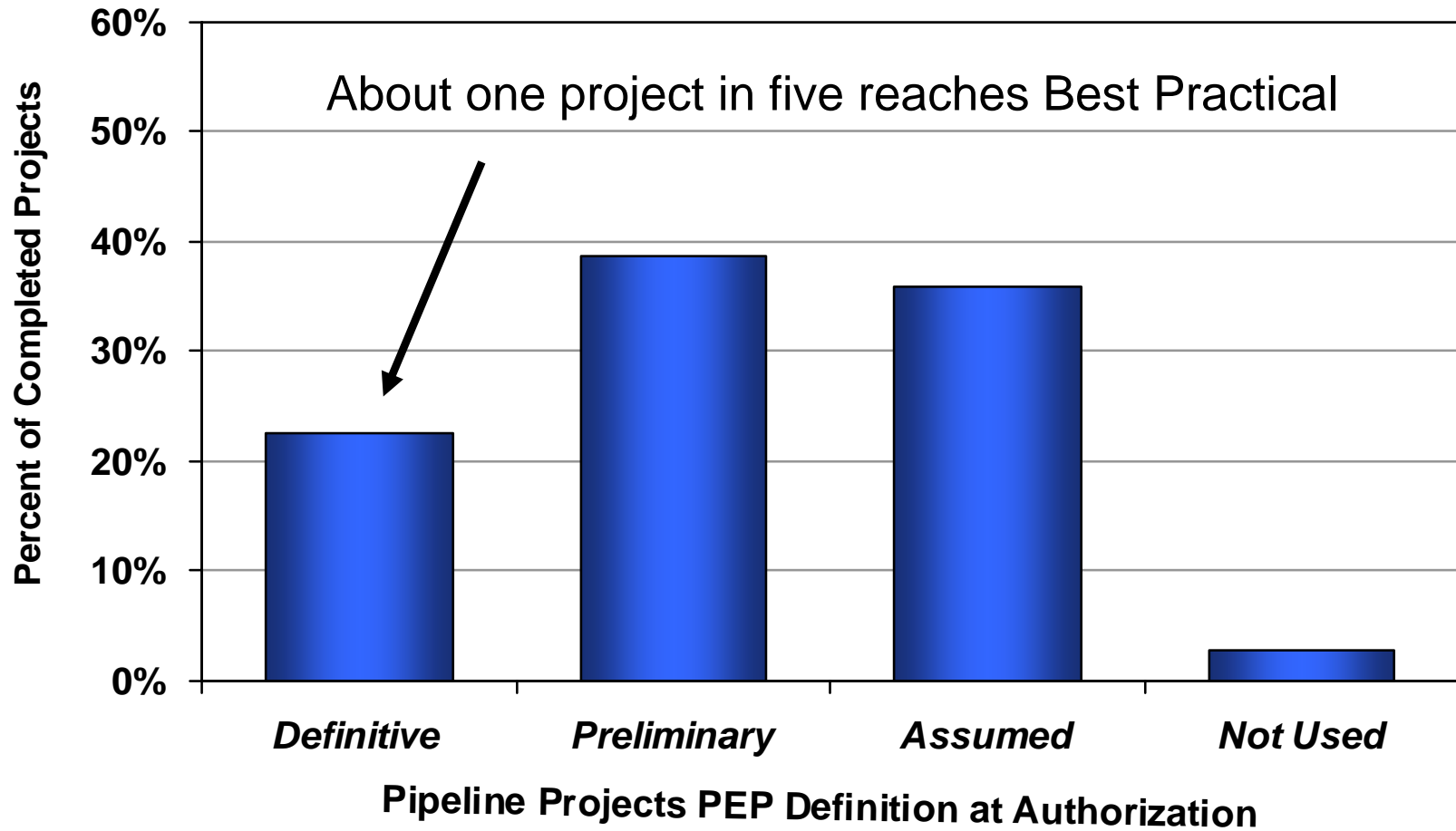
- Contracting strategy
 - Who?
 - How?
- Team participants and roles
- Integrated schedule
 - Critical path items
 - Identification of shut-downs for tie-ins
 - Overtime requirements
- Plans
 - Commissioning
 - Startup
 - Operation
 - Manpower
 - Quality assurance
- Cost/schedule controls

3.00 to 12.00

IPA Front-End Loading Index



Big Opportunity for Improvement





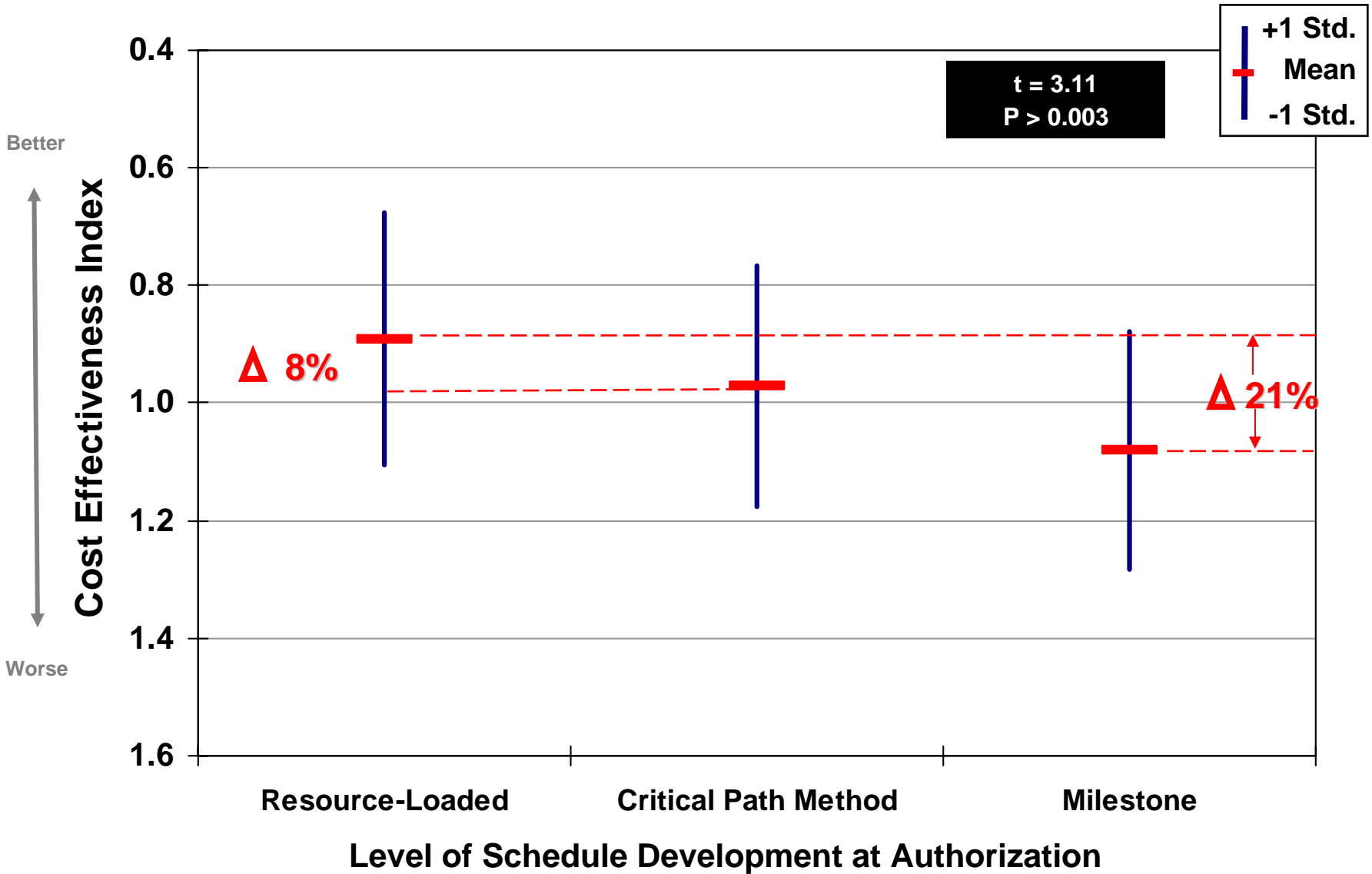
Project Execution Planning is Weakest FEL Element for Pipeline Industry: Is it Really Necessary?

Do project execution plans have to be developed with the same rigor for pipeline projects?

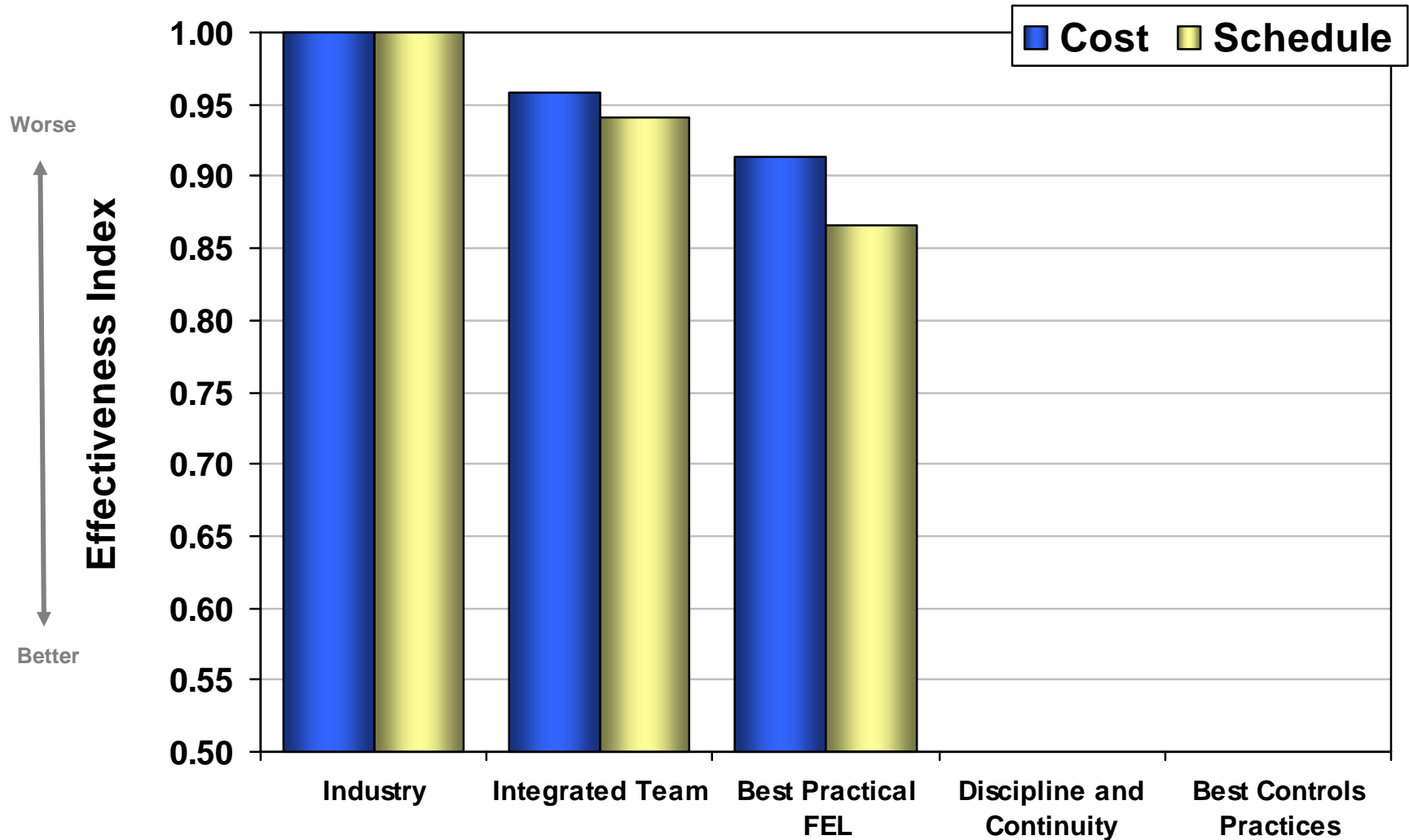
Project teams say:

- ***“Pipeline projects are less complex than other projects.”***
- ***“It is not worth the time and effort to develop a highly detailed plan just for a pipeline project.”***
- ***“The contractor will make a detailed plan later.”***
- ***“We have put in extra contingency and/or allowances in the estimate in lieu of detailed planning.”***

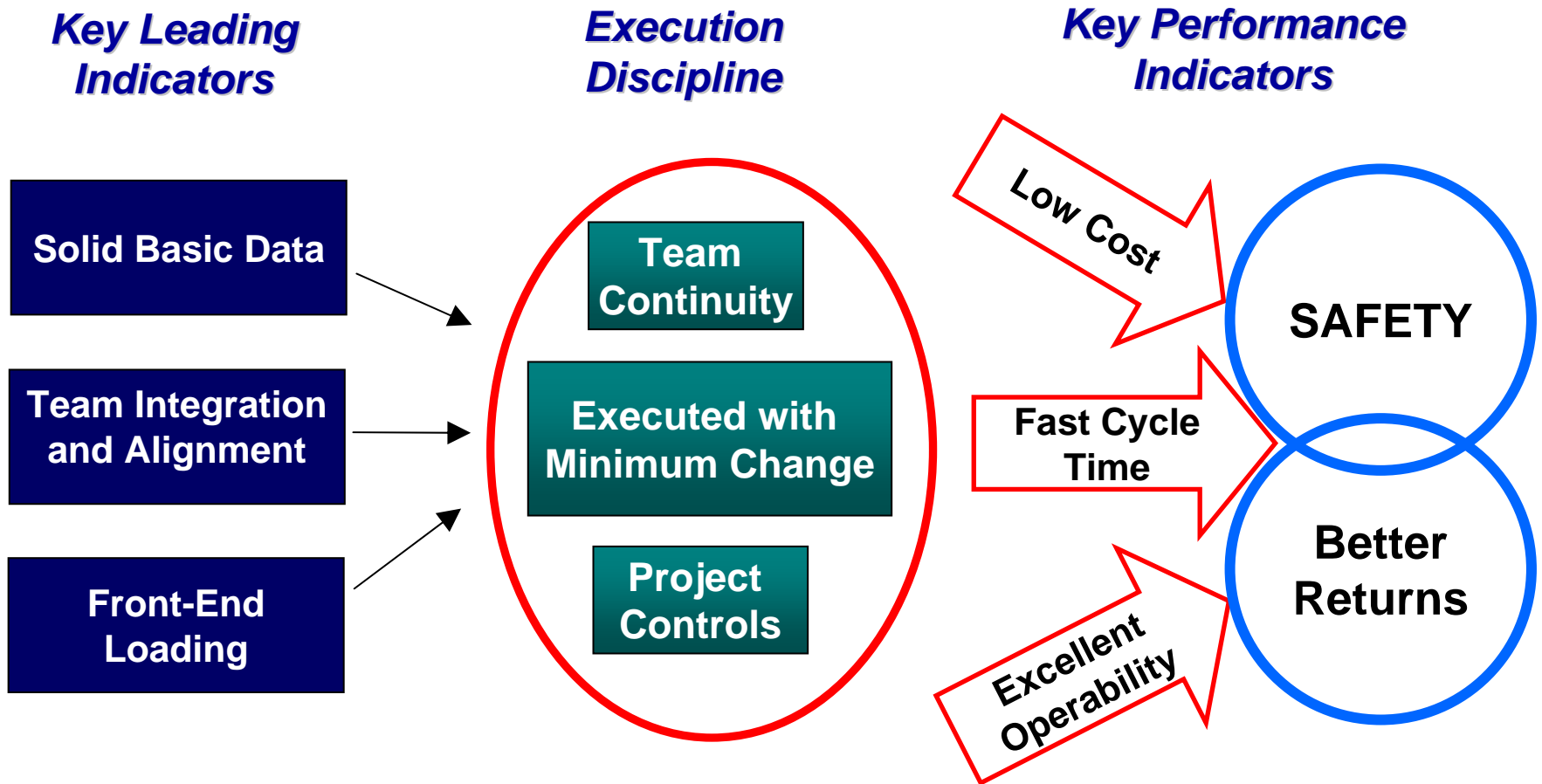
A Well-Developed Schedule Drives Best Performance



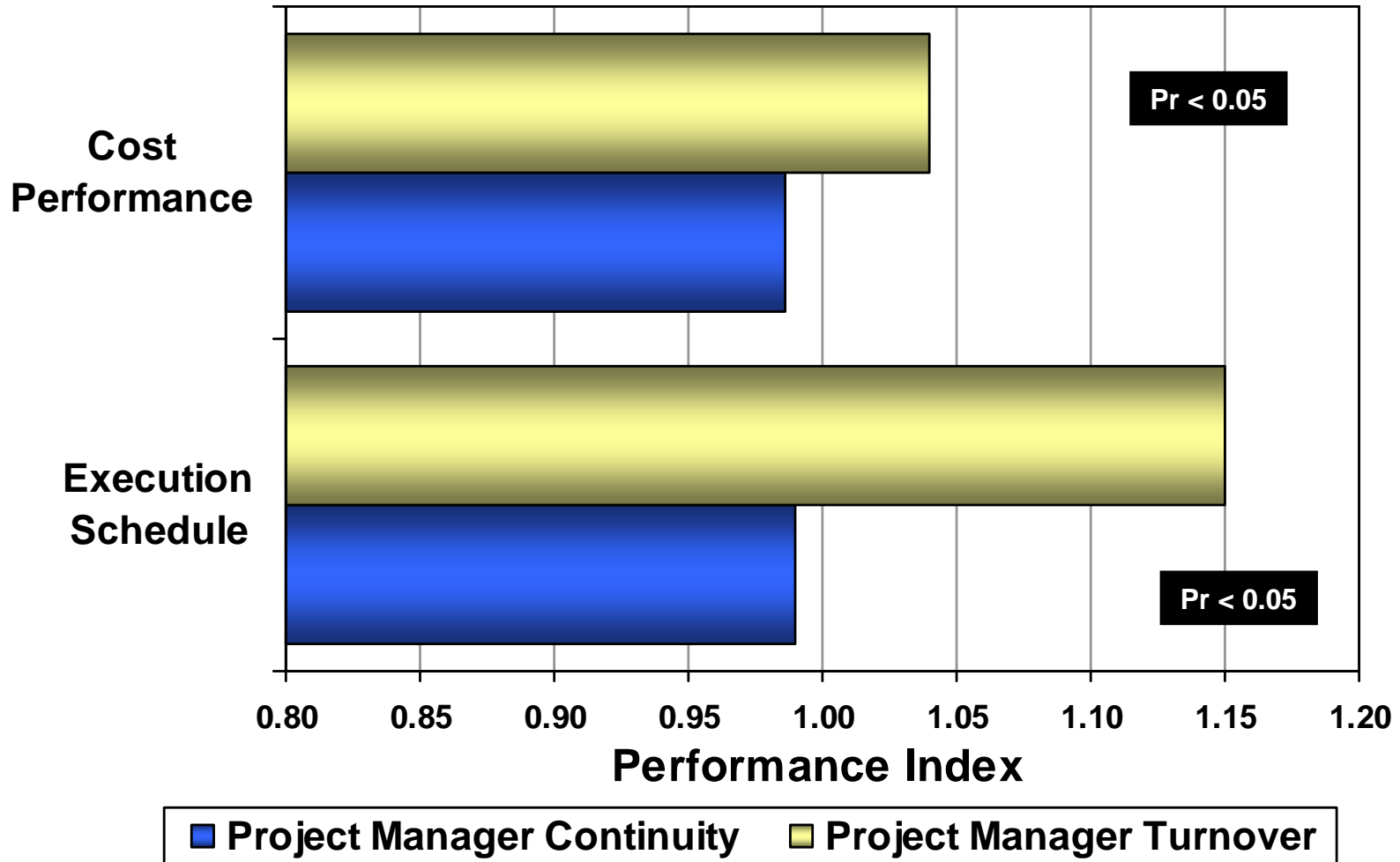
Drivers of Performance for Pipeline Projects



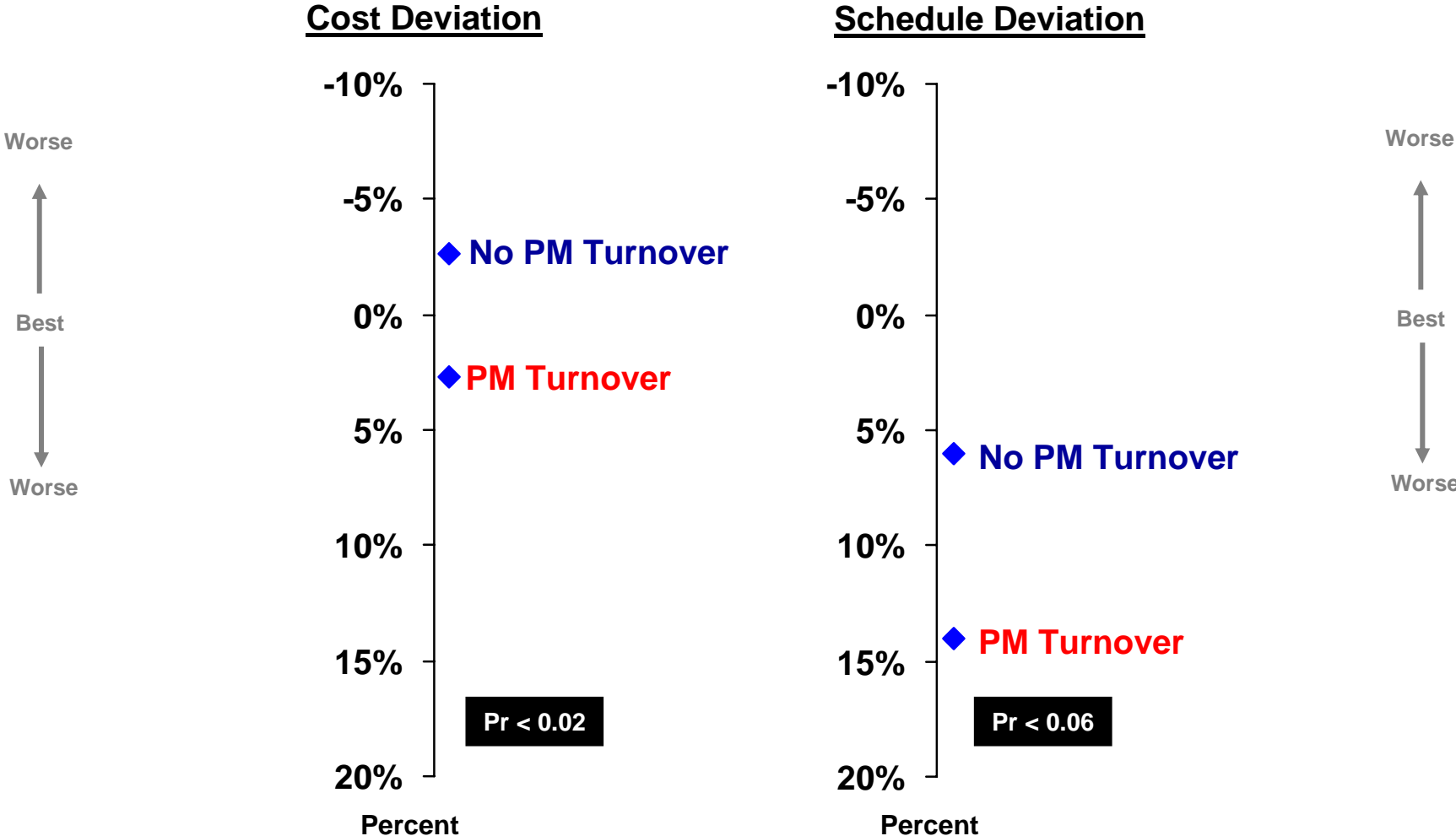
Elements of Capital Effectiveness



Project Manager Turnover Affected Cost and Schedule Performance



Project Manager Turnover Also Affects Cost and Schedule Predictability

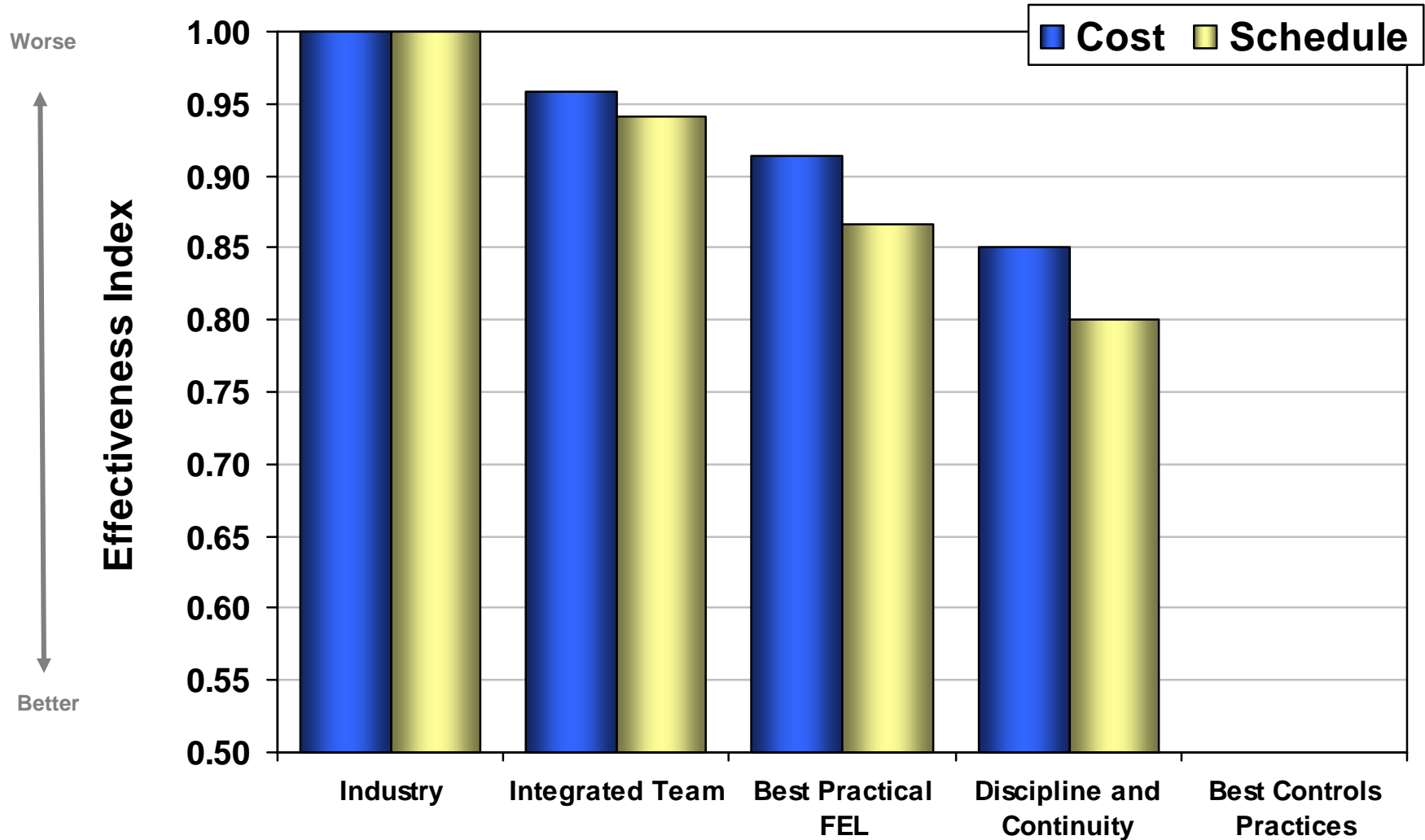




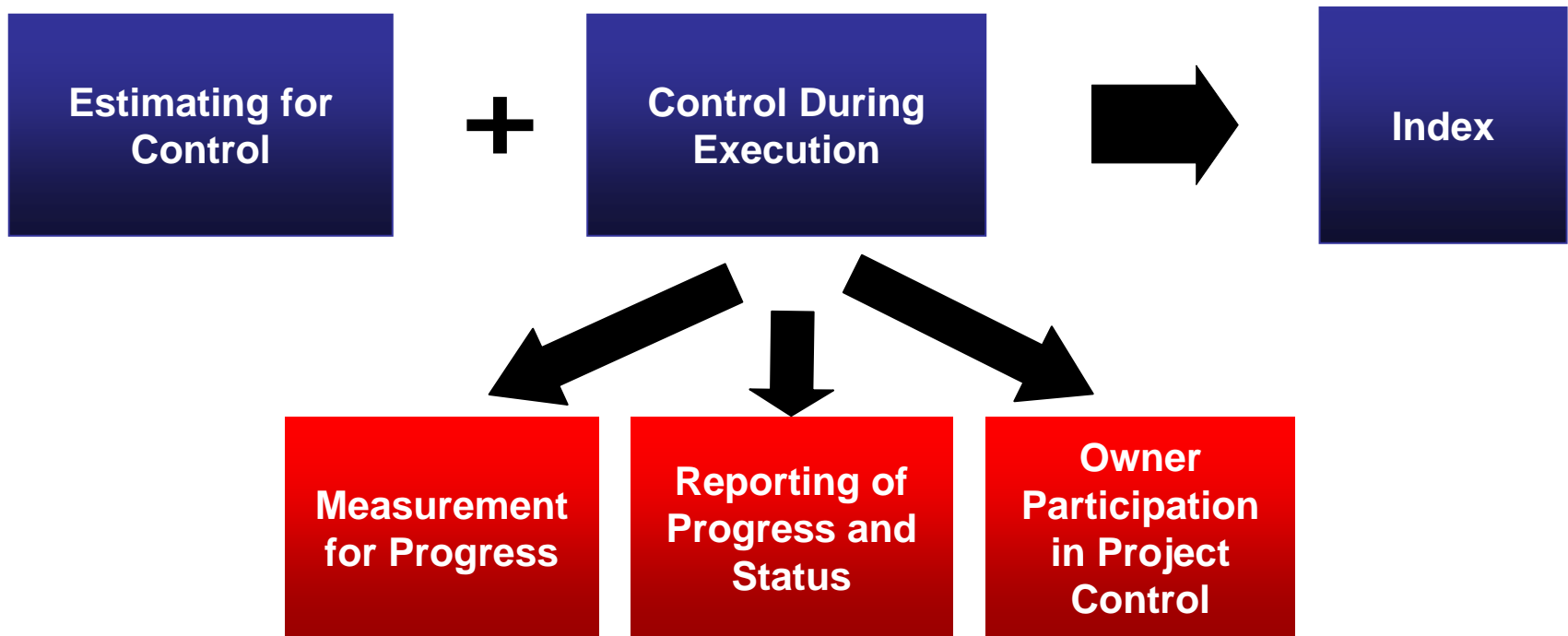
Turnovers are Disruptive

- Turnovers of key personnel, both owner and contractor, are disruptive to the project
- Schedule is most affected
- *Every turnover is an opportunity for undesirable change to occur*

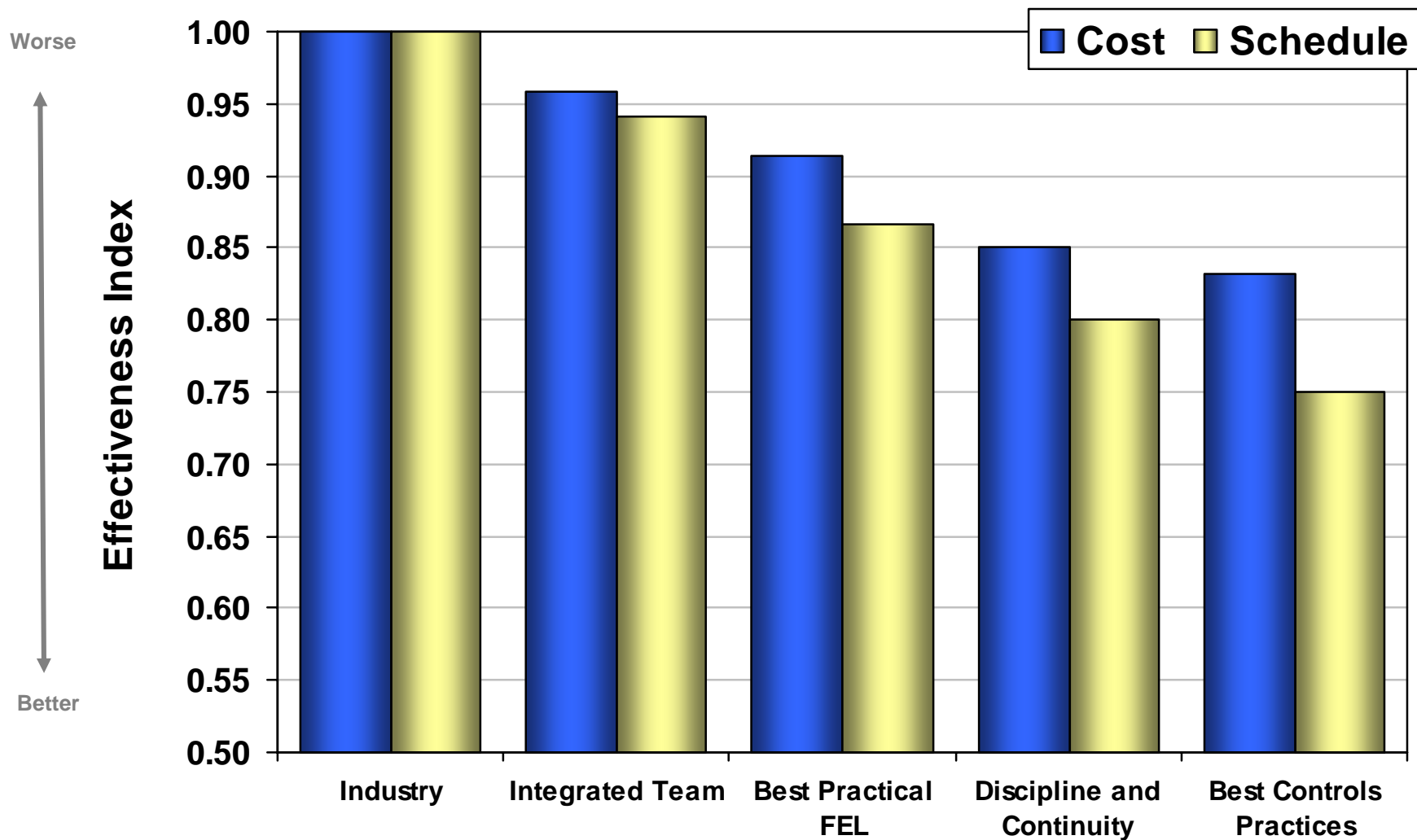
Drivers of Performance for Pipeline Projects



The Project Control Index (PCI)



Drivers of Performance for Pipeline Projects





Conclusions

- **Industry is wasting huge amounts of money and time**
- **Simple changes in the way we are approaching projects could save that money and time**
 - **Develop a sound Basic Data package**
 - **Fully integrate the project teams**
 - **Do *Best Practical* front-end loading**
 - **Execute with discipline**
 - **Exercise sound project controls**
- **When we do, we get great results**
- **And when we don't.....**



This is the type of pipeline that results.....





Thank you for your attention!