

Managing the Dynamics of Projects and Changes at Fluor

COOPER ASSOCIATES

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Imagine an industry where...

- Primary differentiator between competitors is their history of project outcomes
- Highly educated individuals, fresh out of college or graduate school, have no idea of what could be the most career-damaging event
- Professionals through personal experience know the consequences of certain events affecting project outcomes, but for decades had no credible method to analyze (much less explain **or foresee**) such events
- Senior executive careers have been ended as a result of failing to fully understand and grasp the consequences of these events
- A major international corporation recognizes hundred of millions of dollars in losses in large part from not understanding and acting in time to mitigate those losses
- That same corporation budgets an amount equal to an entire year's earnings to fund dispute resolution activities arising from these same events

A few words about Fluor

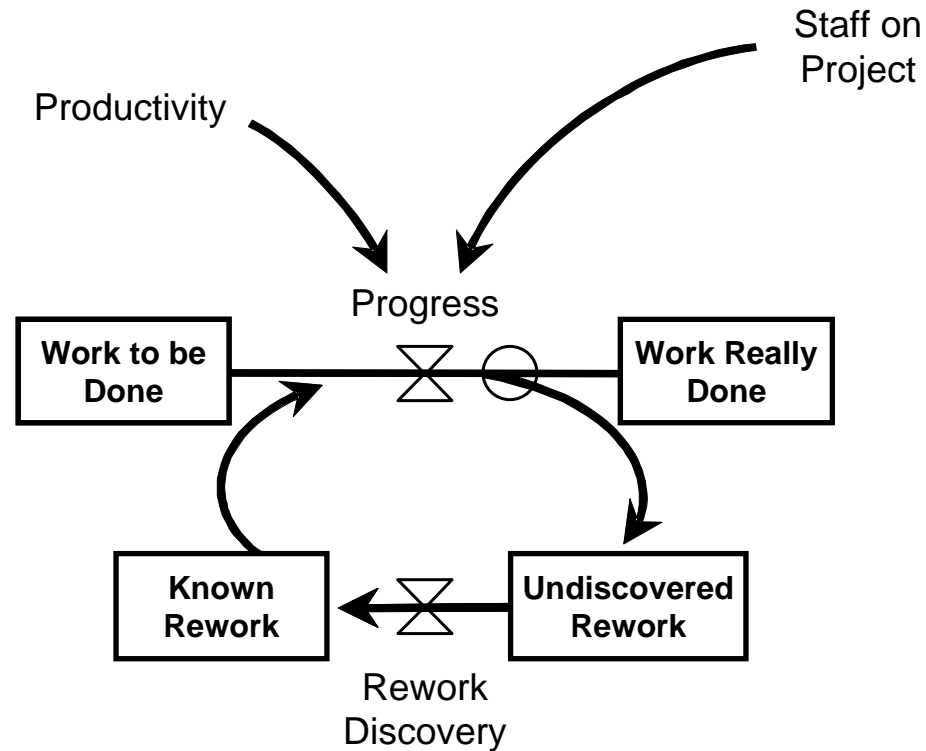
- “*Architect to Industry*” (\$20 billion revenue)
- Highly centralized
- Resistant to change
- Business line specific cultures
- Highly diversified
 - Energy (production, refining, chemicals, power)
 - Commercial (hotels, office buildings, concert halls, food products)
 - Industrial (mining, pharm/bio, manufacturing, consumer goods)
 - Infrastructure (airports, hospitals, highways, high speed & light rail, ports)
 - Federal Government - DOD, DOE (nuclear fuel cycle), DOS

Introduction

- ◆ We have designed, built, tested, and implemented a model-based system to aid project management at Fluor Corporation
- ◆ Model is set up for and tailored to each engineering & construction project
- ◆ Used to foresee future cost & schedule impacts of project changes & events, and most important, test ways to avoid the impacts
- ◆ Rapidly growing use of this “Change Impact Assessment” system--now been used on well over 100 different Fluor projects
- ◆ Hundreds of project managers and planners have been trained in the ongoing internal use of the system
- ◆ Cost savings for Fluor and its clients exceeds \$1.3 billion

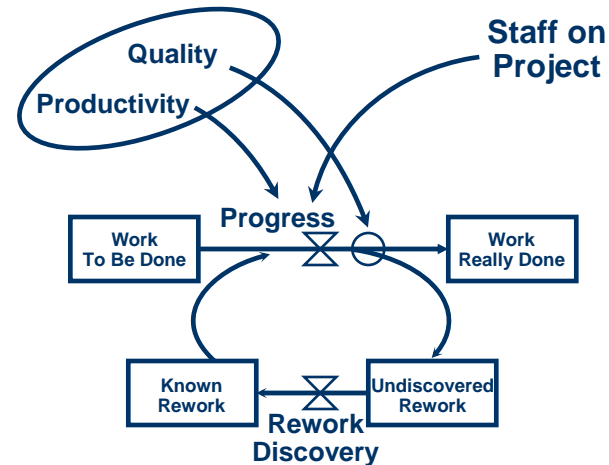
The Rework Cycle...

Work as a flow, executed by people working at a variable productivity, and performing work that may need subsequent rework...the need for which may go undetected for some time.

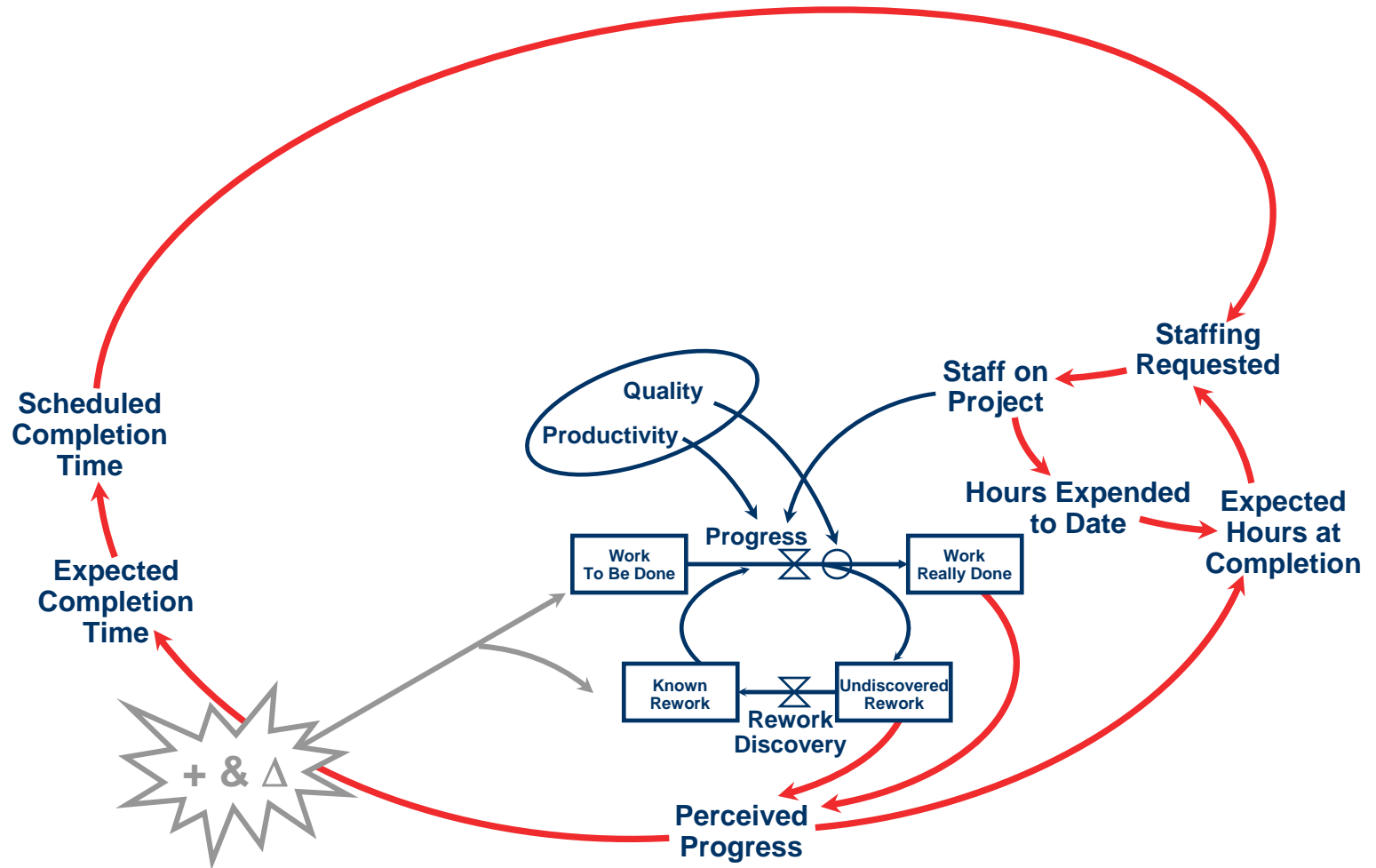


A story from one project, experienced by many...

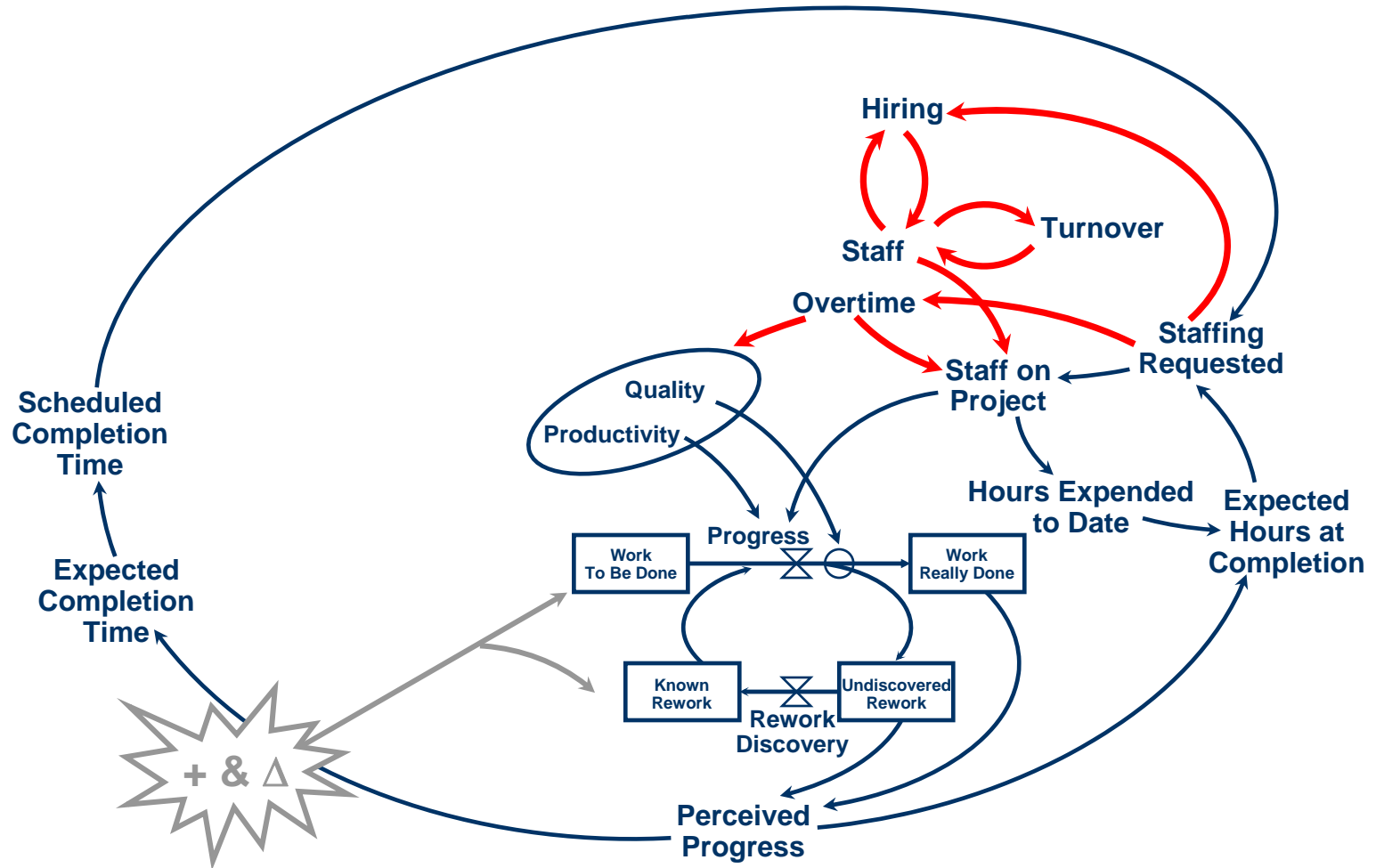
Have you seen any of these next conditions on a project...?



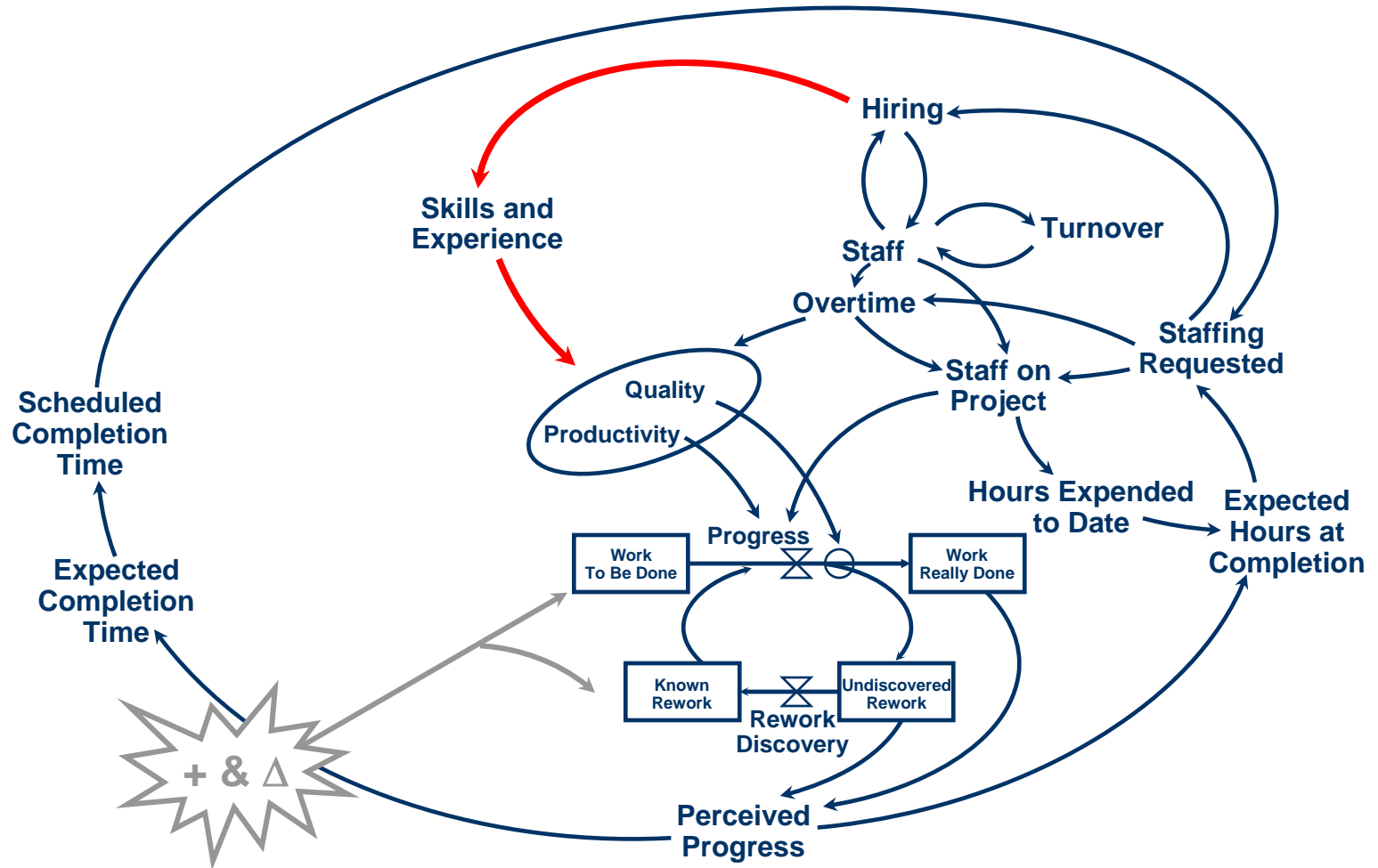
“The customer added (+) and changed (Δ) work so much, we staffed up more.”



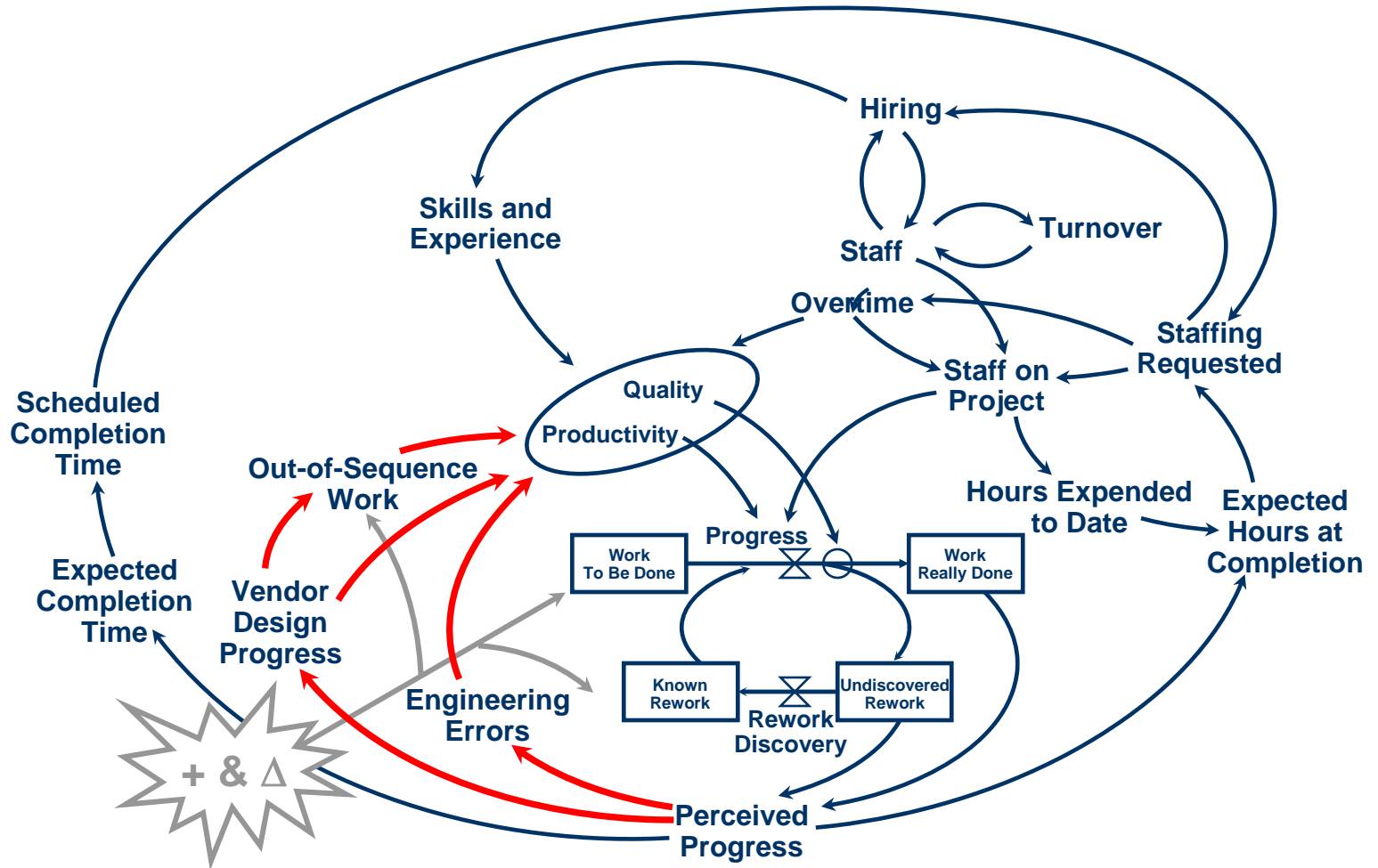
“We used lots of overtime and had to hire in tight markets.”



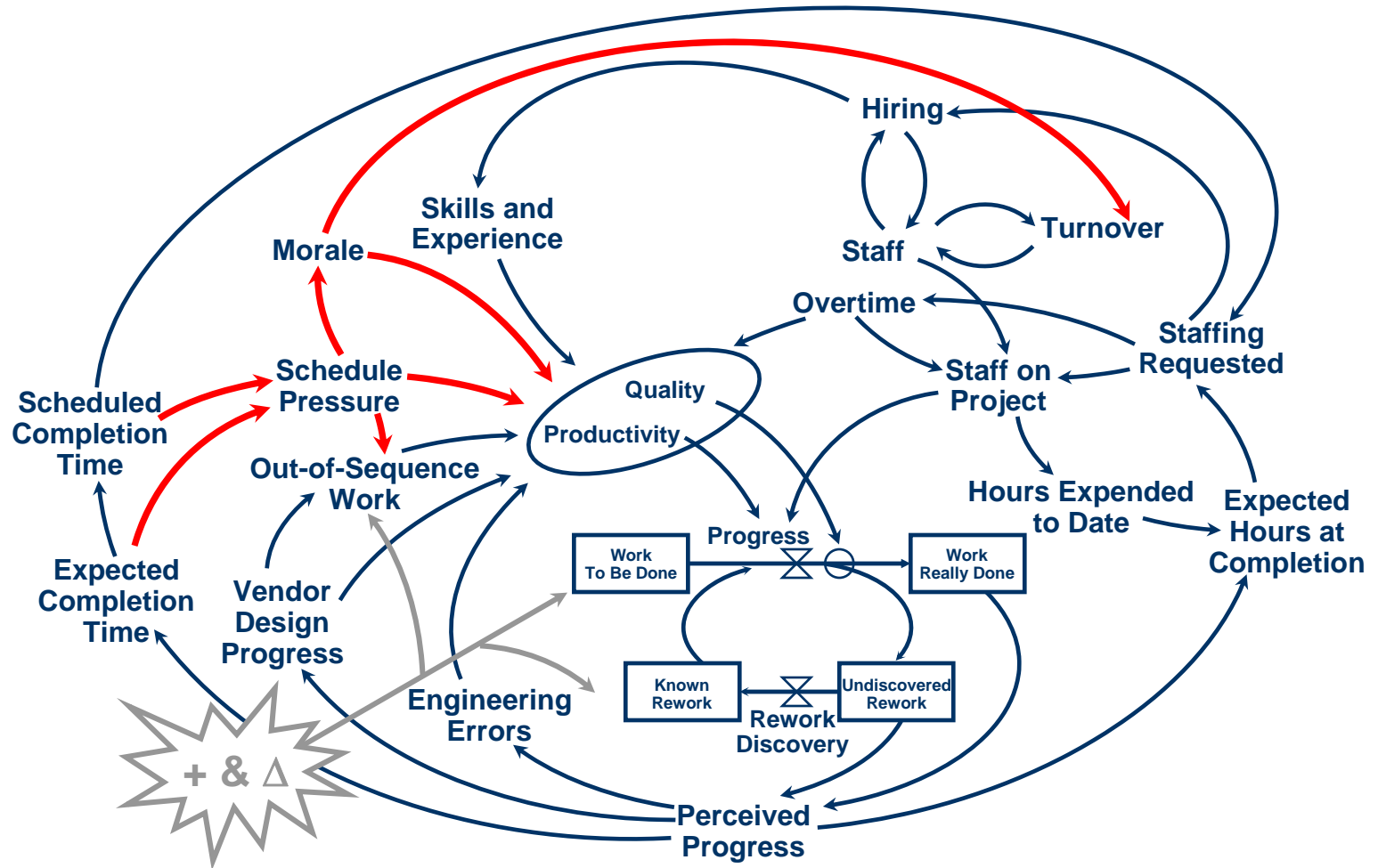
“Less skilled new hires also needed more supervision.”



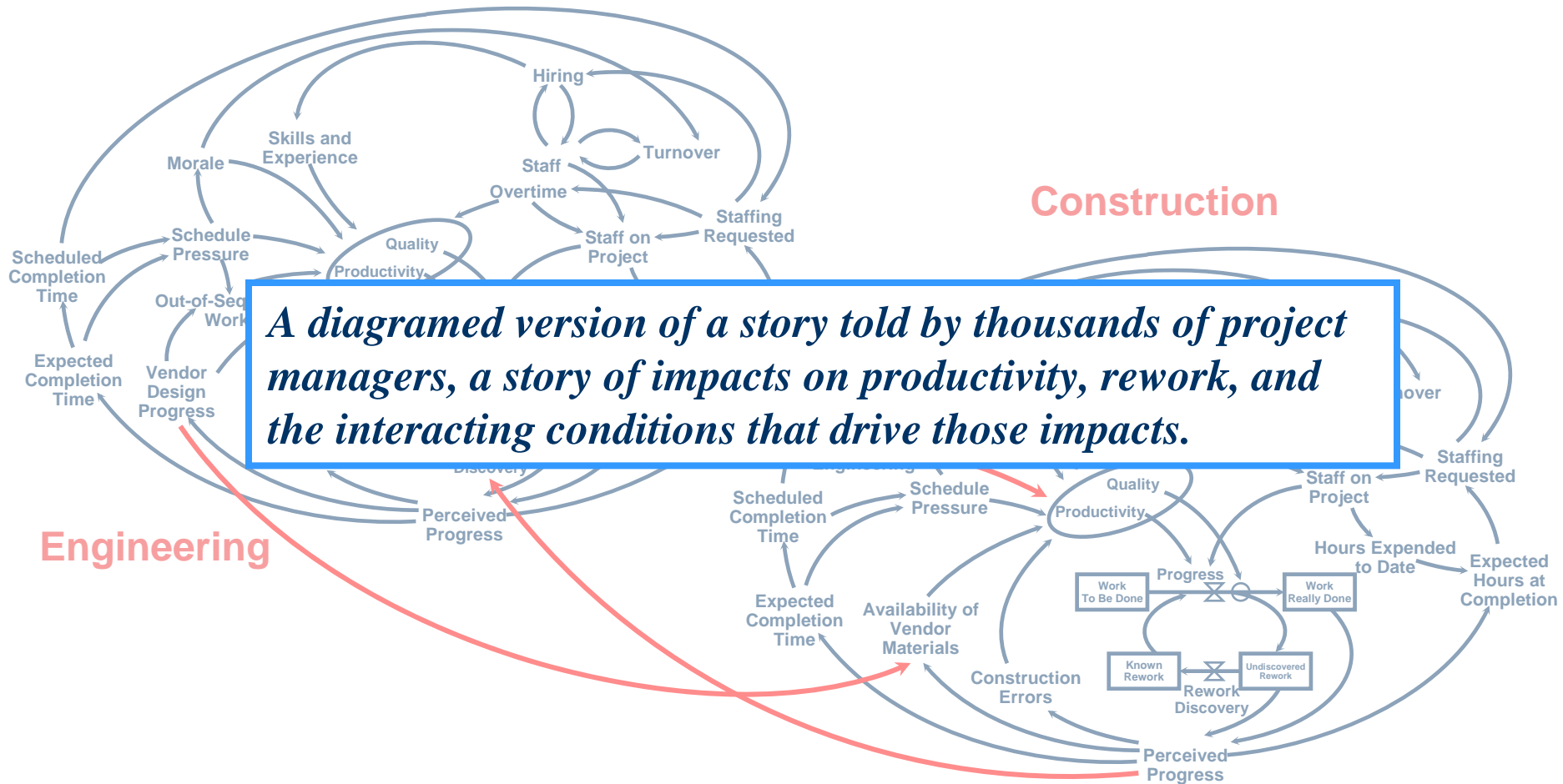
“Rework caused more rework.”



“Under pressure, morale suffered.”

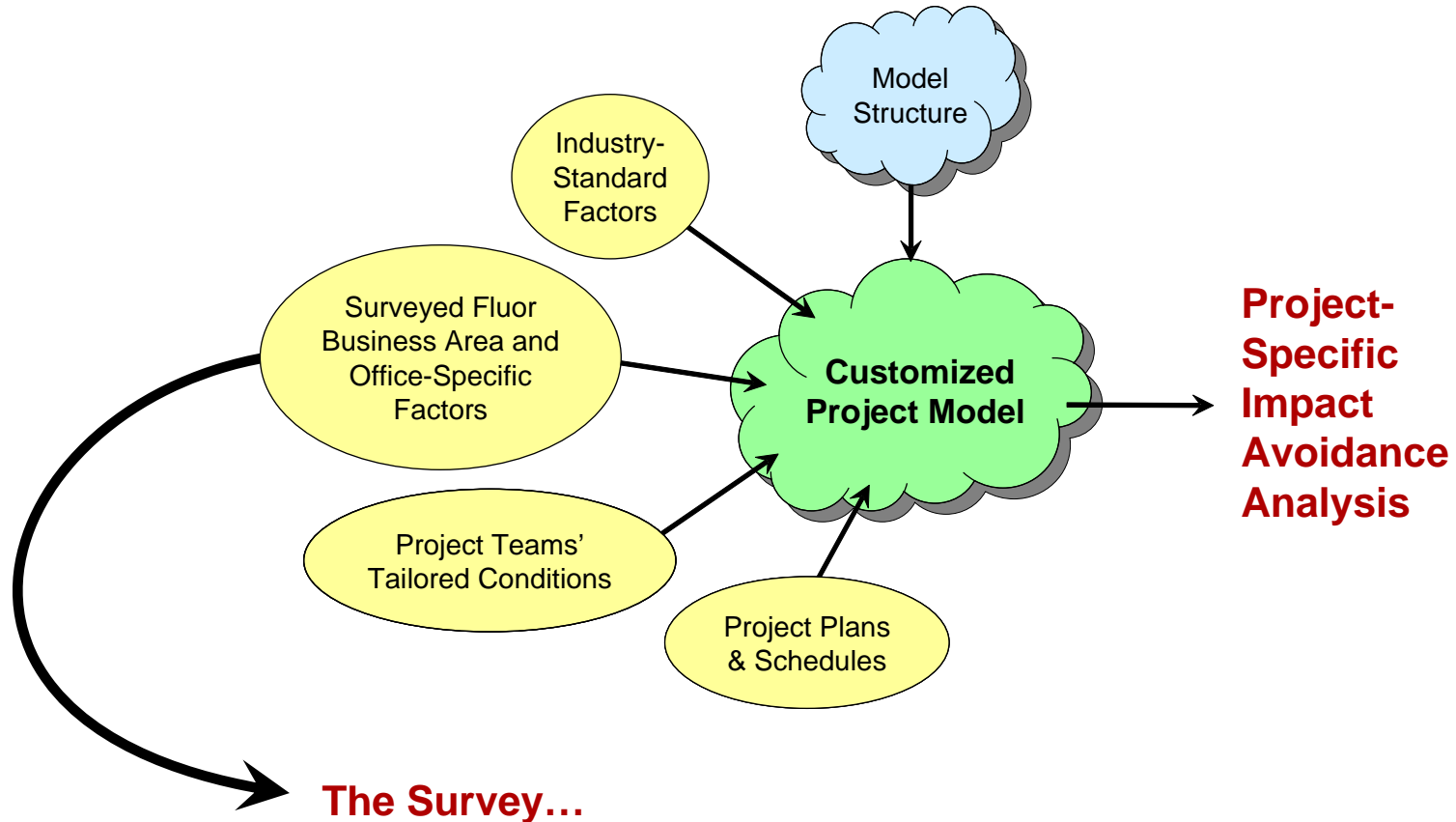


“Late and changing engineering hurt construction.”



Industry benchmarks, company data, project data, and project market conditions are combined to provide a customized model of each project

Standards + Customized Factors... Seeking the best of both worlds



The Survey...

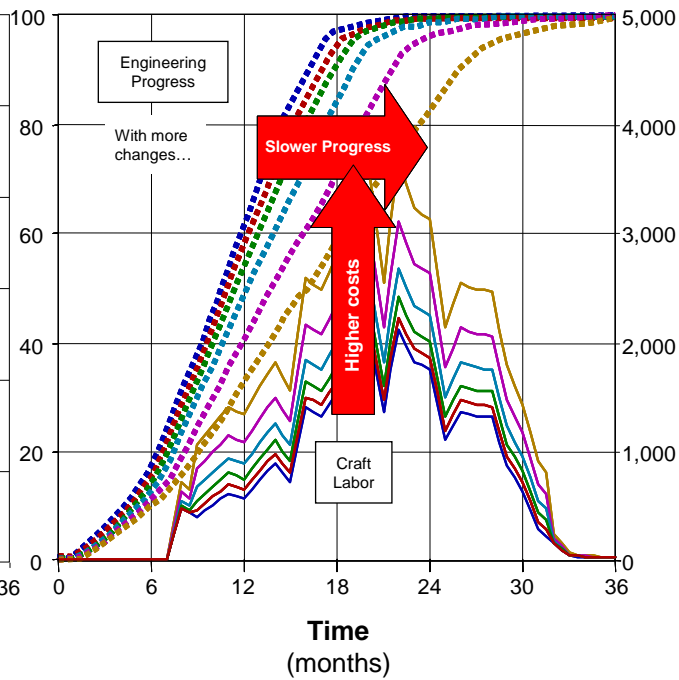
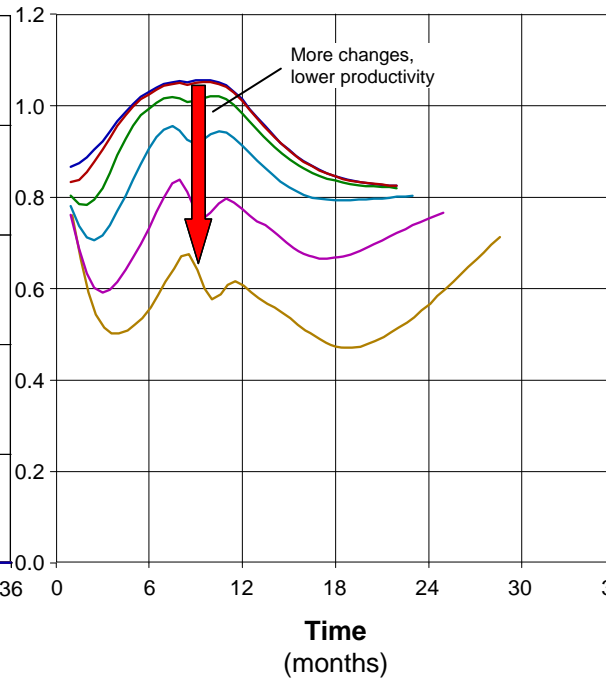
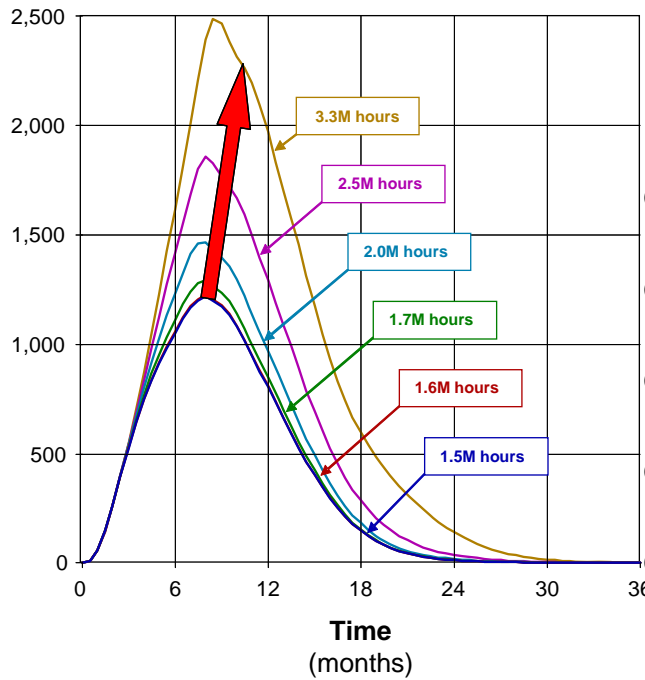
45,000 years of experience in the latest company world-wide survey

Successively higher levels of change cause higher staffing with lower productivity, slower progress, and higher craft labor costs...

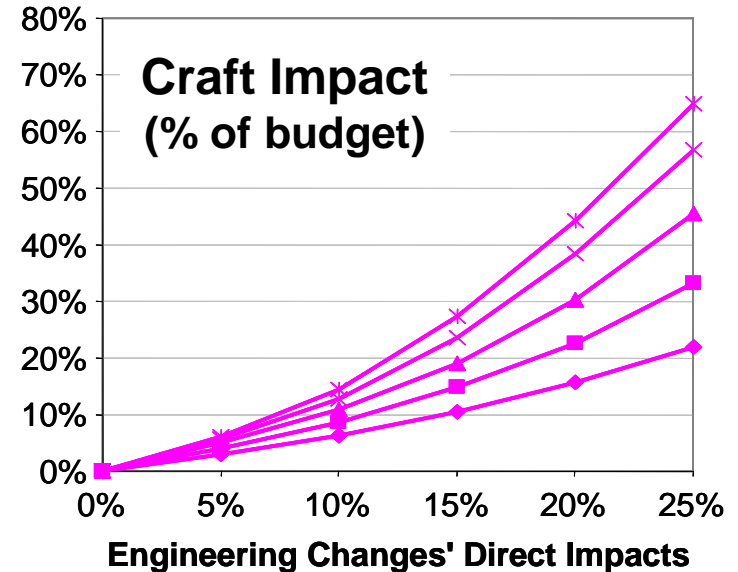
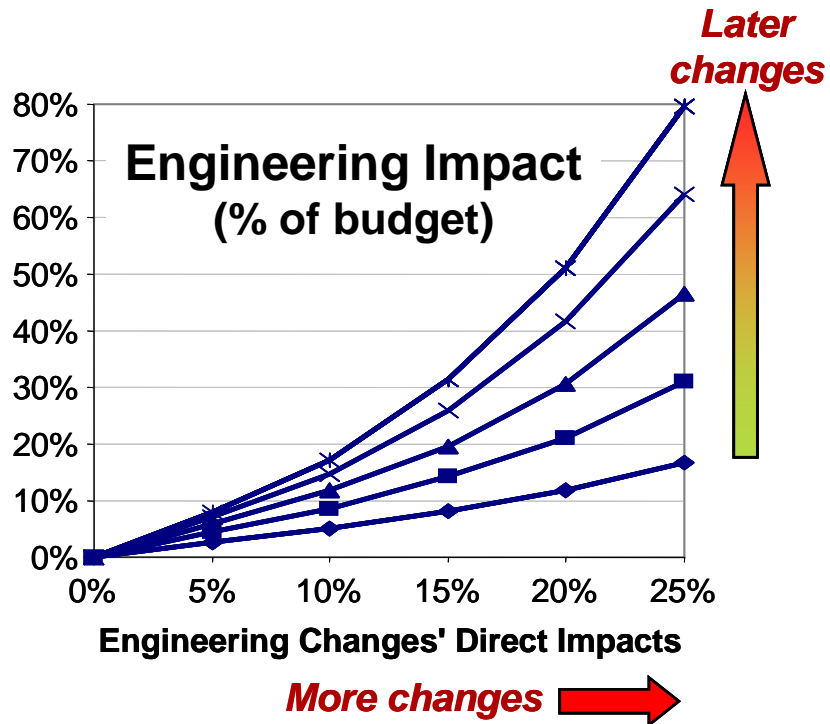
Higher Staffing

Lower Productivity

Slowed Progress

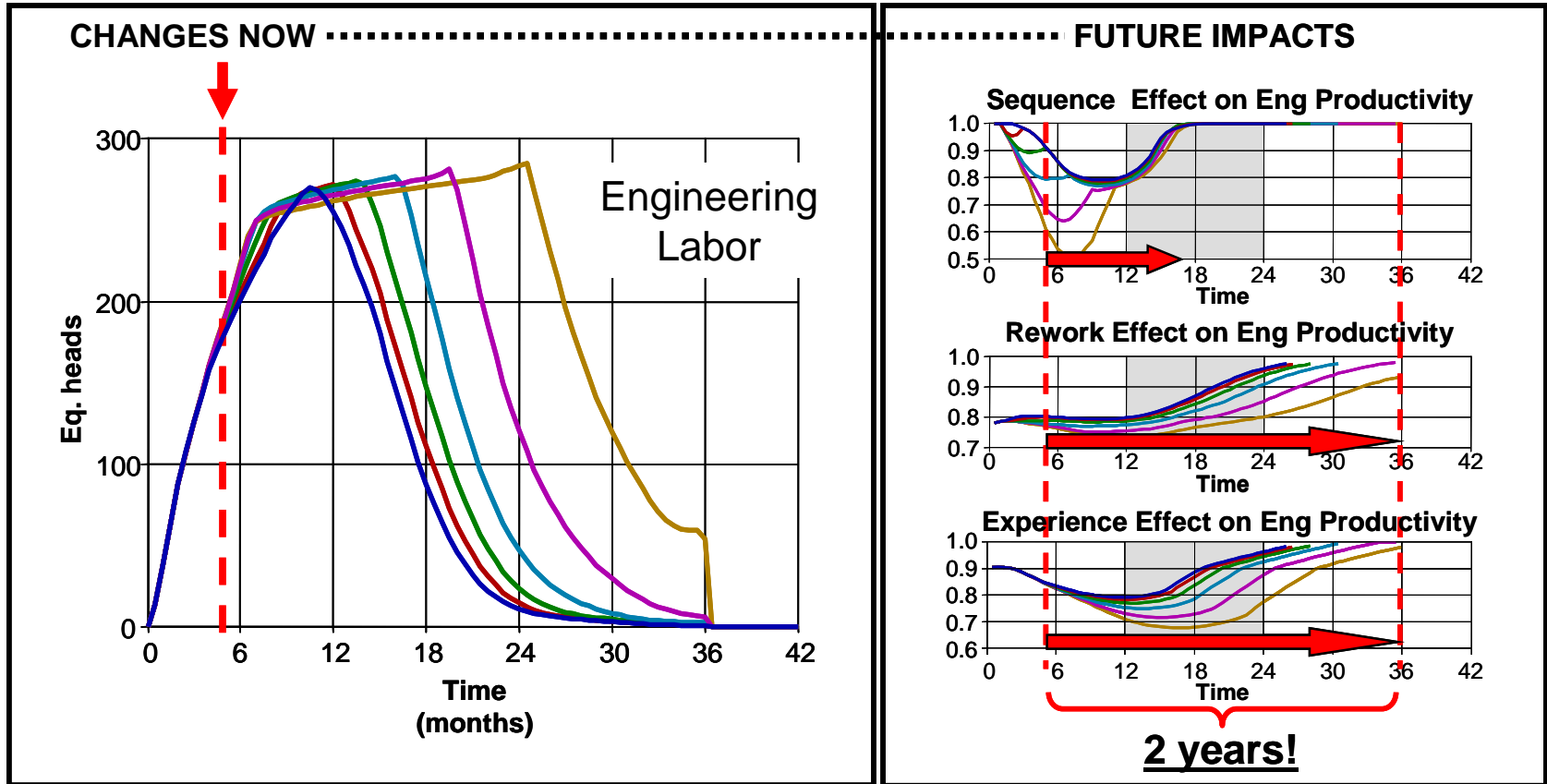


More and later changes create not just more impact, but disproportionately more impact...



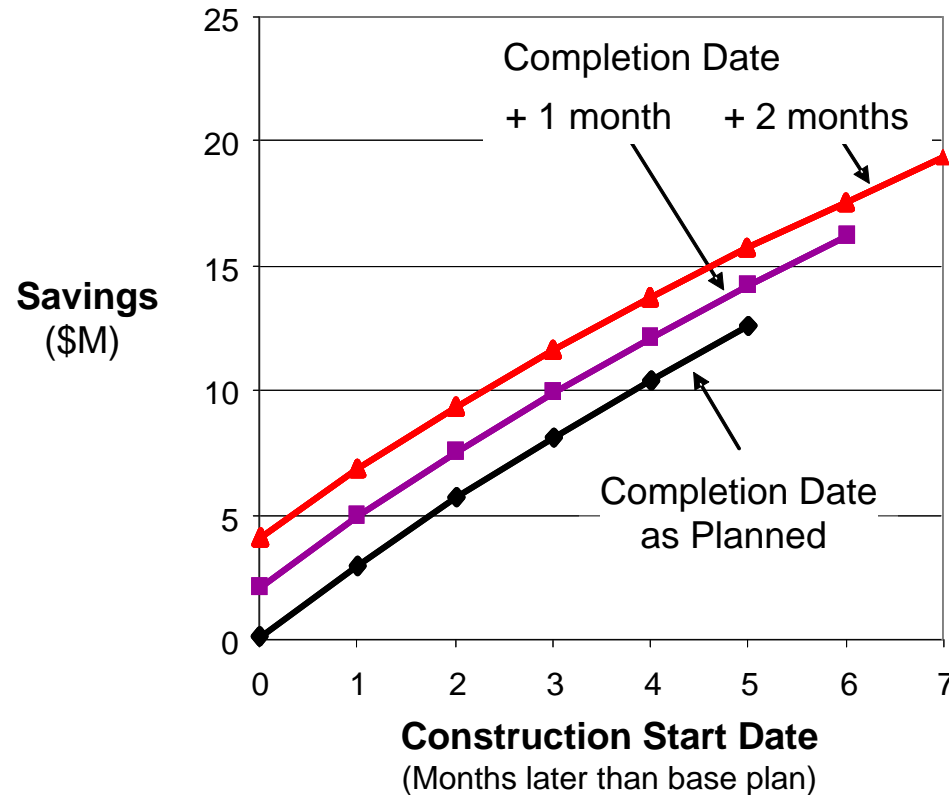
Secondary impacts of engineering changes permeate the entire project. The amount of impact varies with the amount and timing of the changes. The modeling allows Fluor to foresee future impacts and to quantify the impacts of engineering changes.

Advance quantification and diagnosis show how much, when, and why...



The modeling effort allows Fluor to identify the timing of future impacts and diagnose the causal components of the impacts.

There are measurable tradeoffs between (a) costs and (b) construction start and completion dates...

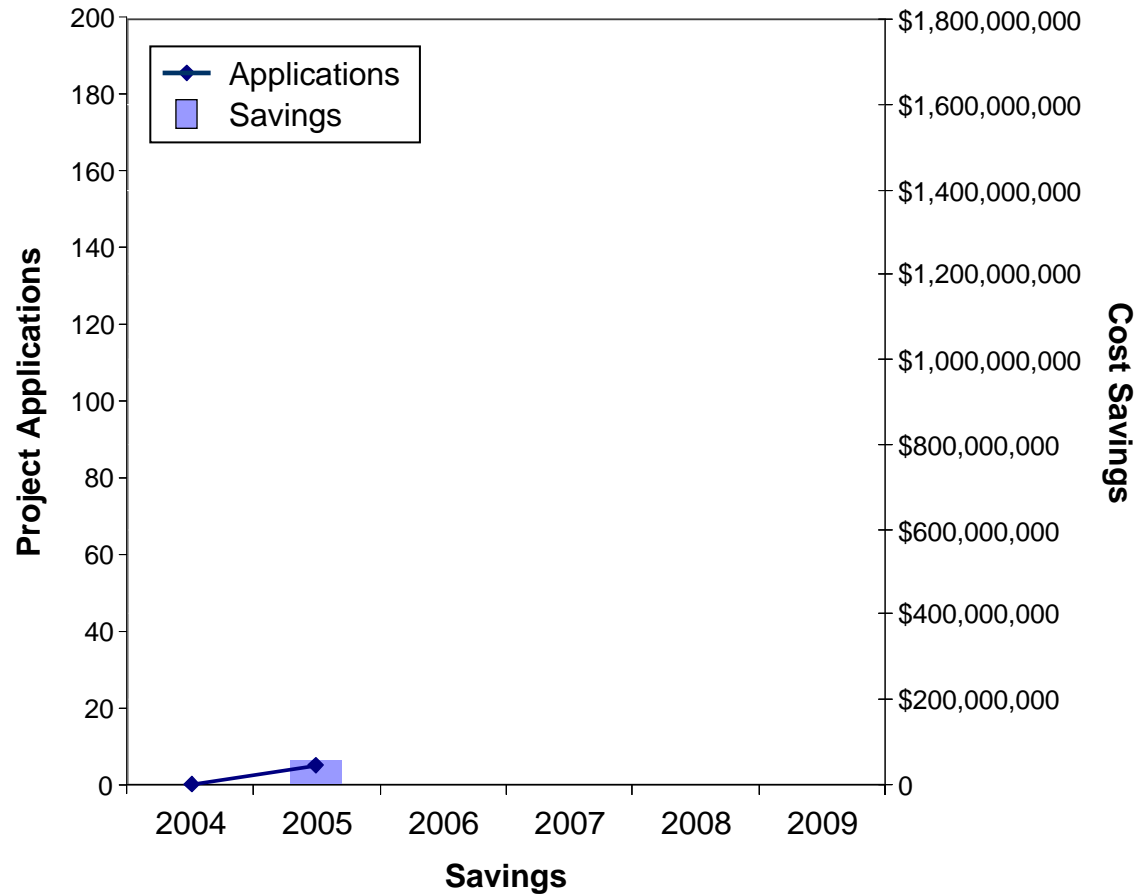


The modeling effort allows Fluor to examine scheduling options and their effect on cost impacts.

Project applications and benefits are growing strongly

2005... First Uses

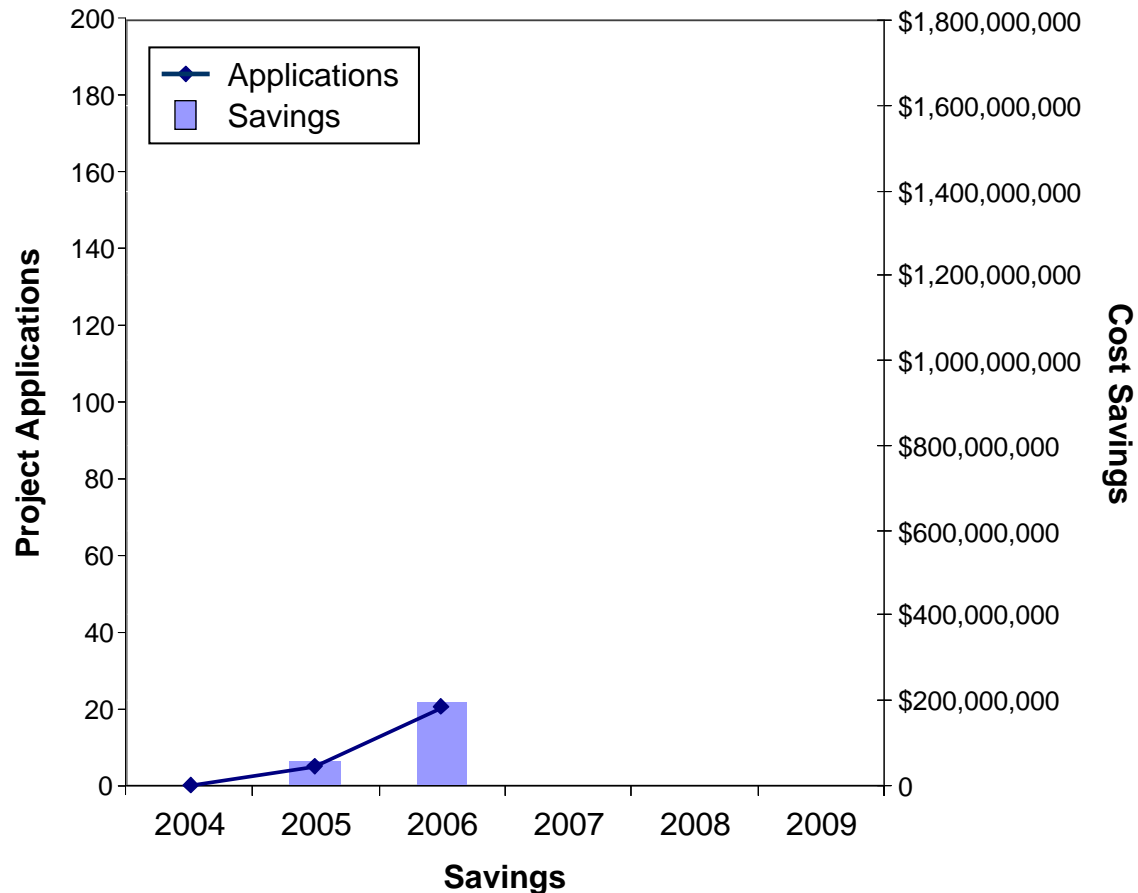
- ◆ A few pioneering projects
- ◆ Management funds first training
- ◆ Clients: No exposure



Project applications and benefits are growing strongly

2006... Increasing Acceptance...

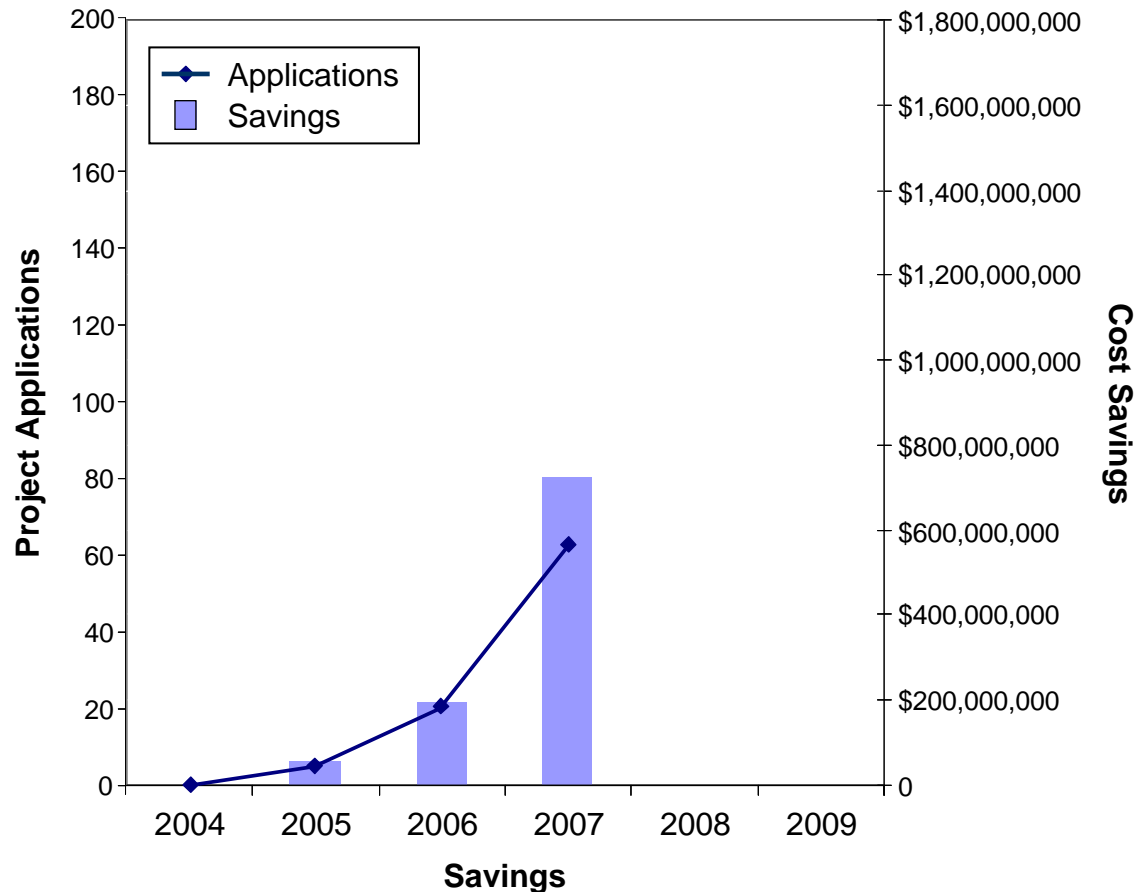
- ◆ Global productivity survey
- ◆ Increased use to quantify many change impacts
- ◆ Management funds all project applications, mandates use on 'risk' projects
- ◆ Clients: initial exposures with positive responses



Project applications and benefits are growing strongly

2007... Upswing in demand, positive response...

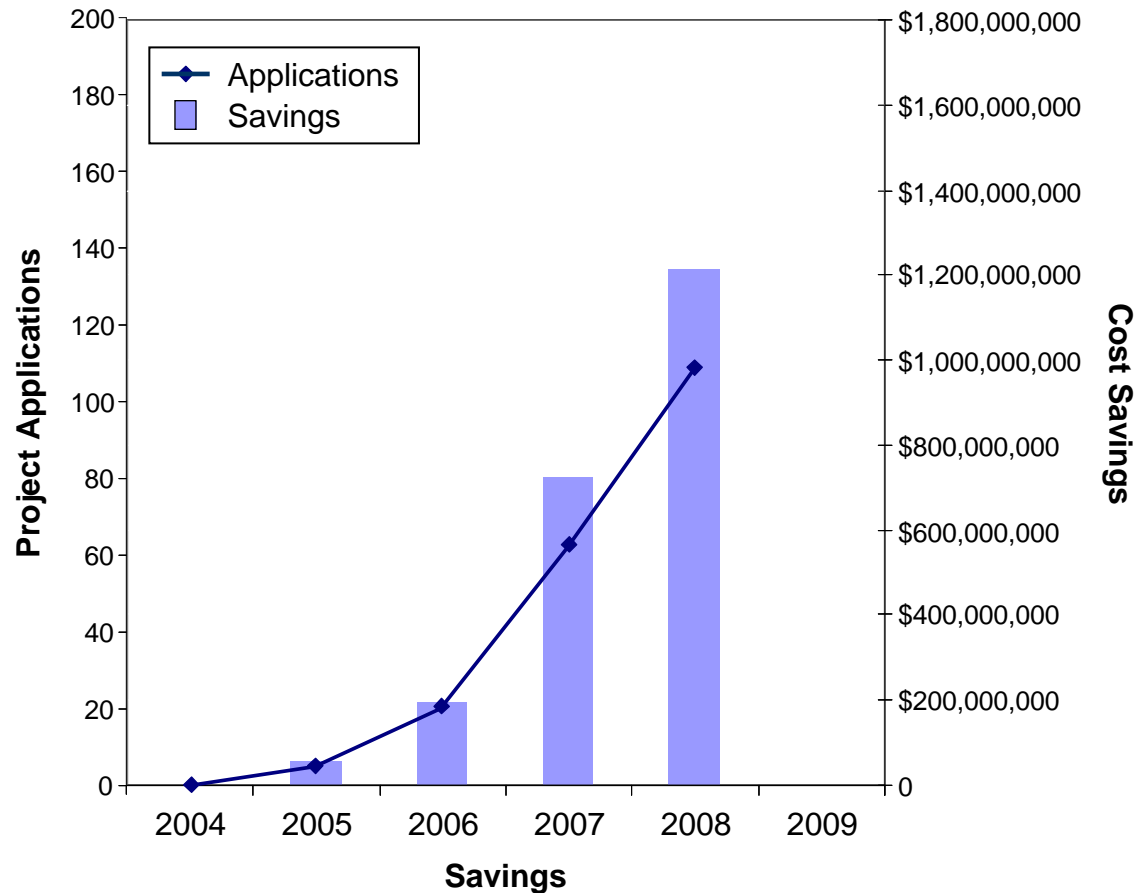
- ◆ Projects routinely use at the start of Engineering to assess pre-emptive actions
- ◆ Management: widespread commitment
- ◆ Clients: more are briefed on selected projects



Project applications and benefits are growing strongly

2008... Institutionalized Use...

- ◆ Used to pre-plan projects, advance cost mitigation
- ◆ Training required for all Project Managers
- ◆ Management: accepted as valuable, even as sales advantage
- ◆ Clients: global executives briefed, strong response



Project applications and benefits are growing strongly

2009...A competitive differentiator

- ◆ New global productivity survey
- ◆ Industry awareness – ECRI, CII
- ◆ Many clients view Change Impact Assessment as a distinctive value-added benefit
- ◆ Nothing short of a **paradigm shift** in project management thinking

