

Integrated Technology Delivery™ of Airport Systems

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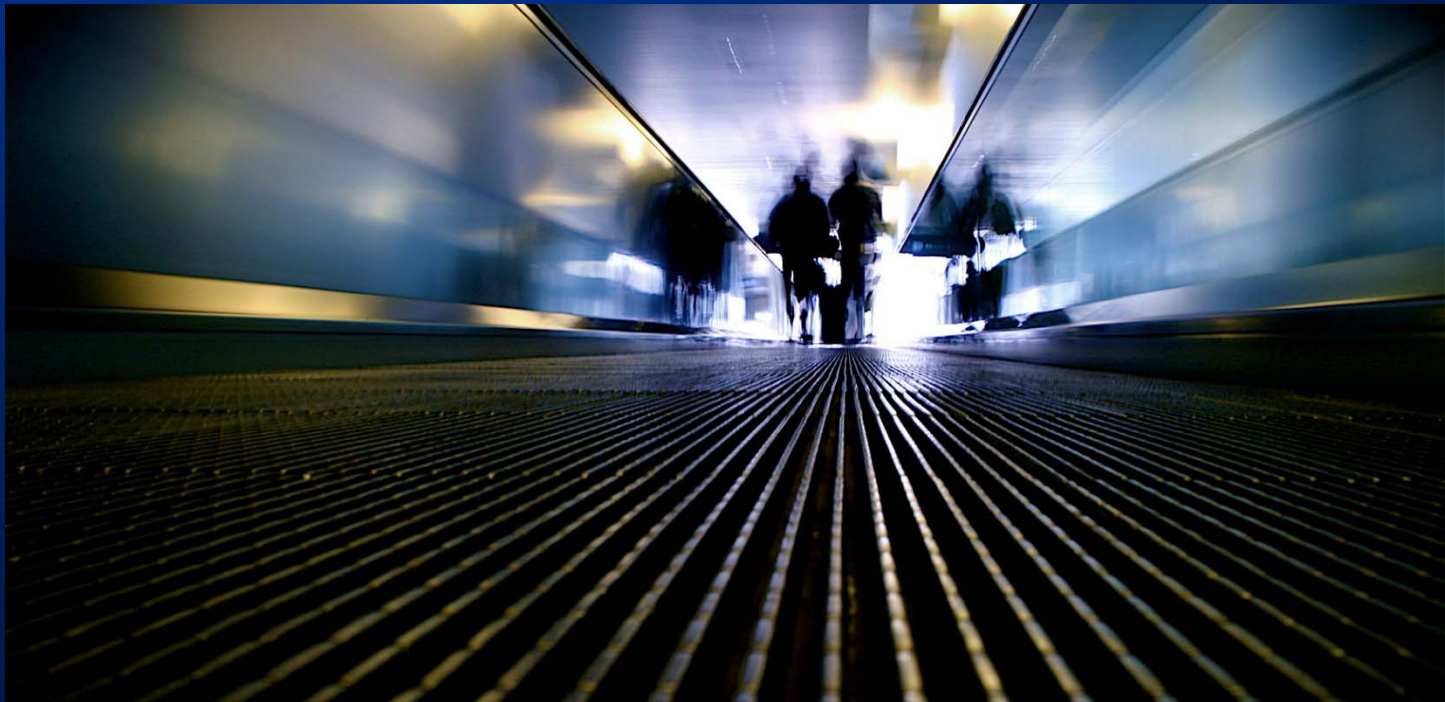


Overview



The Question is...

How do you effectively include technology and special systems into your development program?



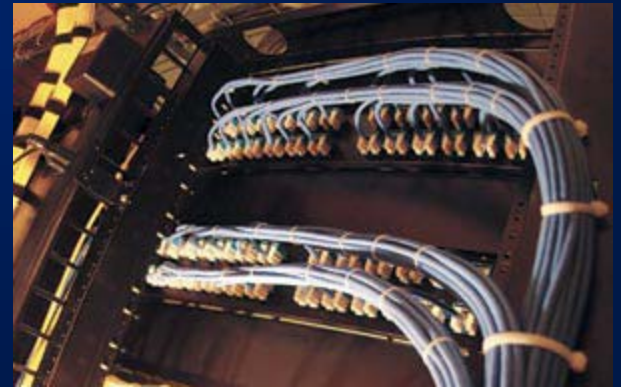


What are “Special Systems”?

- Passive fiber and copper infrastructure
- Active network
- Operational hardware and software
- Displays, kiosks, workstations, etc.
- Access control, CCTV & intrusion detection
- Both conventional and VoIP telephone
- Fire alarm
- Building automation, baggage handling, security, etc.
- Testing and commissioning

Implementation is Challenging

- Early inclusion in the project is critical
- Technology solutions must be flexible
- Many decision makers are not tech savvy
- Delivery does not follow normal construction methods





Tech Project Delivery Methods

- Conventional consultant/contractor
 - Design-bid-build
- Conventional design-build
- System Integrator
 - CM @ Risk
- Integrated Technology Delivery™ (ITD)
 - A variation of design-build

Stakeholders' Needs

- Perception between management and technical staff
- Proven systems vs. bleeding edge
- Deliver contemporary technology
- Control design & construction risk
- Provide predictable total cost of ownership (TCO) or return on investment (ROI)
- Systems delivered by technologists, not a general contractor



Problems With Traditional Contracting of Technology

- Good ideas are held back – not timely
- Transactional contracting limits cooperation and innovation
- Inability to fully manage integration
- Parties must defend their turf
- Low bid usually wins!



Integrated Technology Delivery™ Benefits

- More precise scope
- Efficient documentation
- Reduced change-order environment
- Field efficiency
 - Timely Procurement
 - Tasks performed by most suitable supplier
 - Elimination of rework

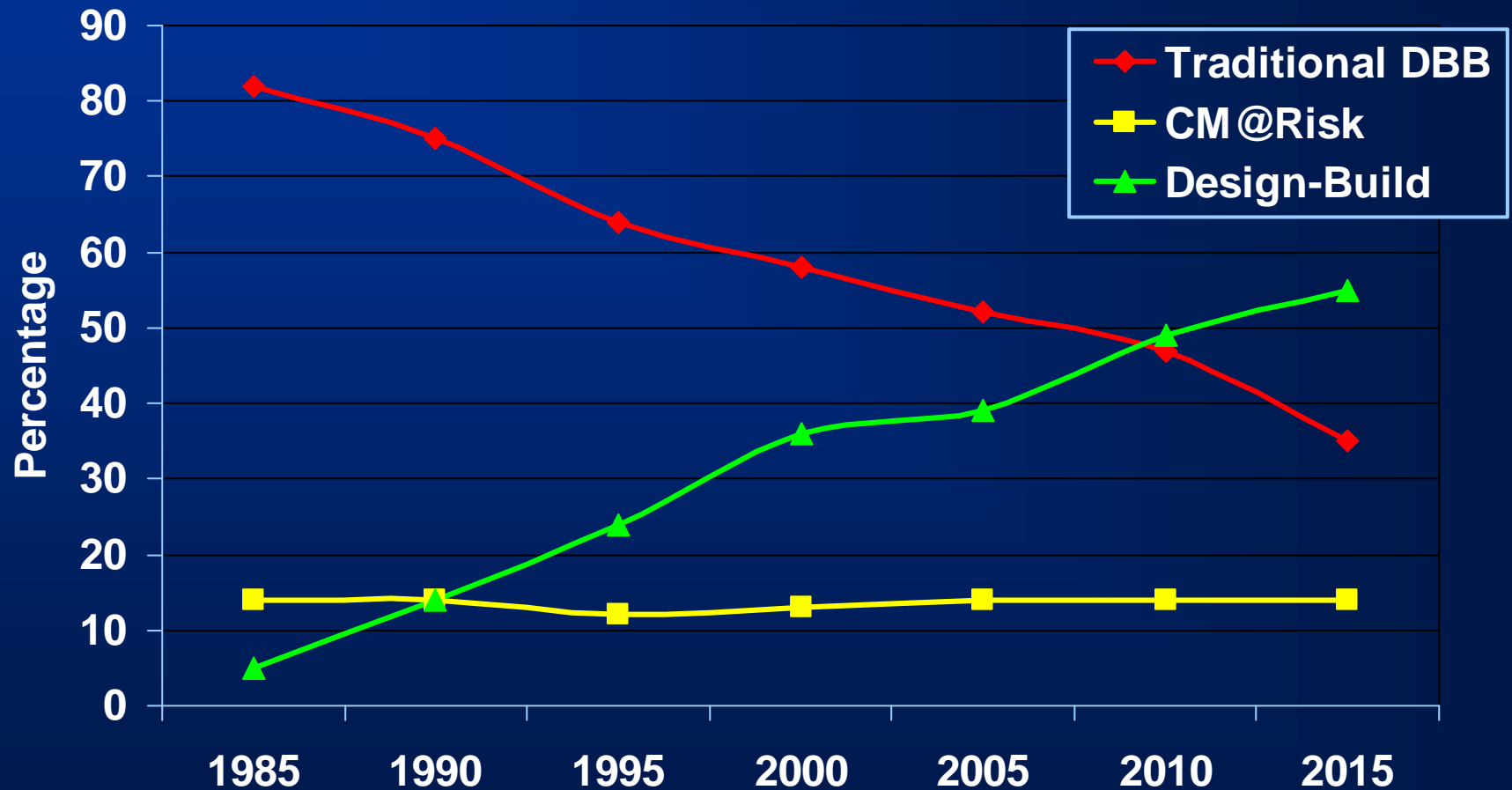
On Time – On Budget – Better Results

Project Delivery Methods

A Quick Review

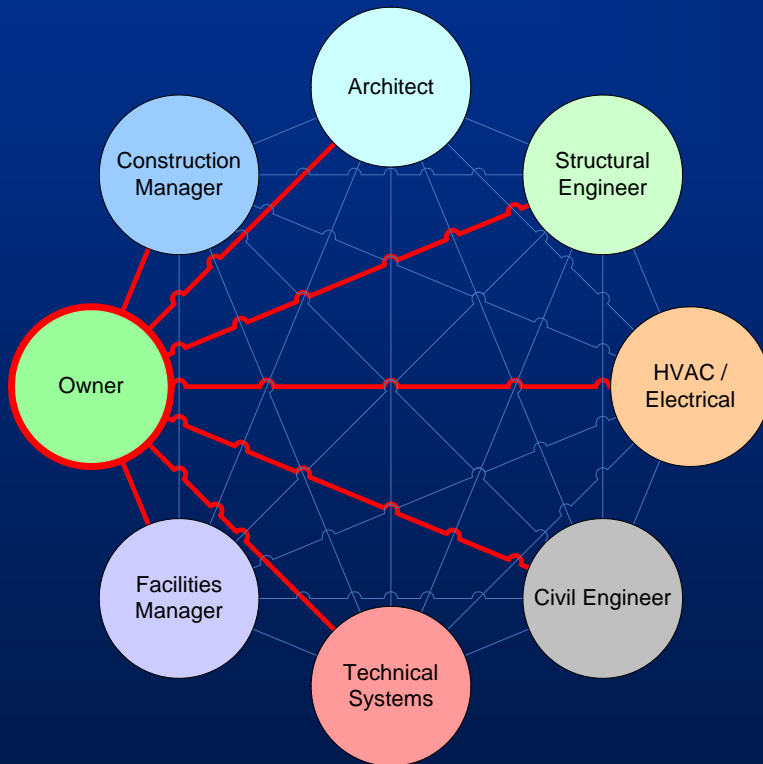


Project Delivery Market

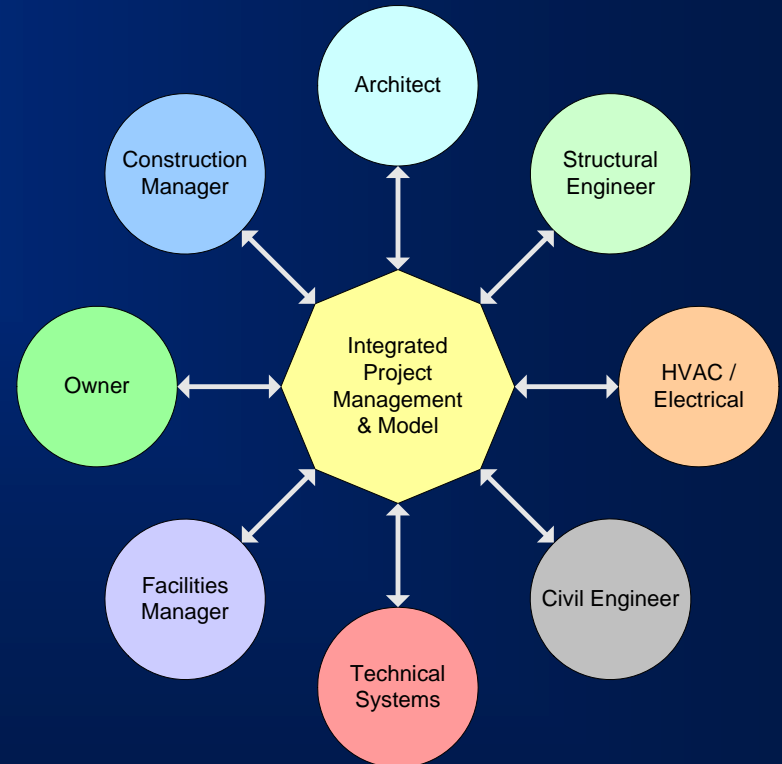


Construction Relationships

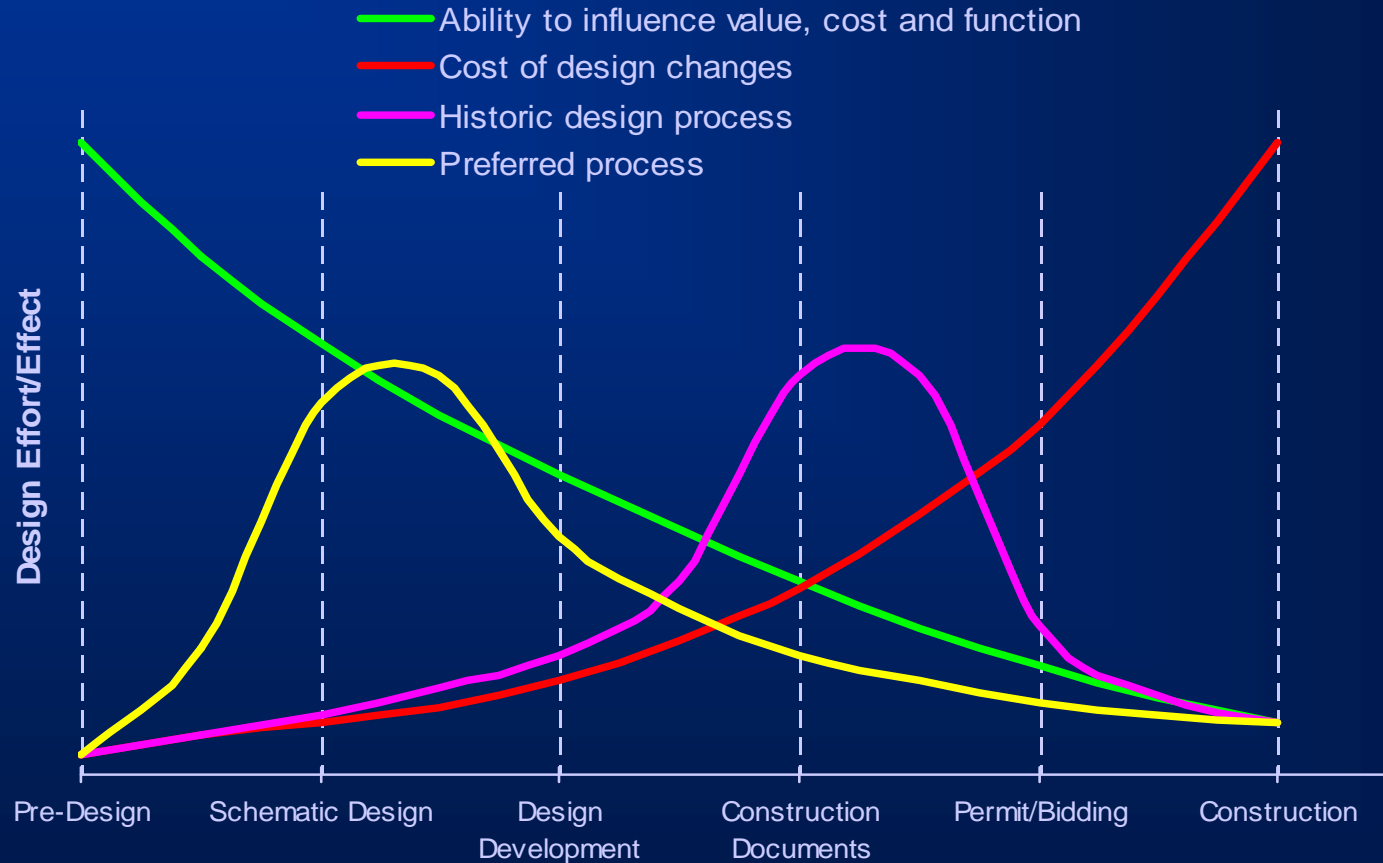
Traditional



Integrated



MacLeamy Curve

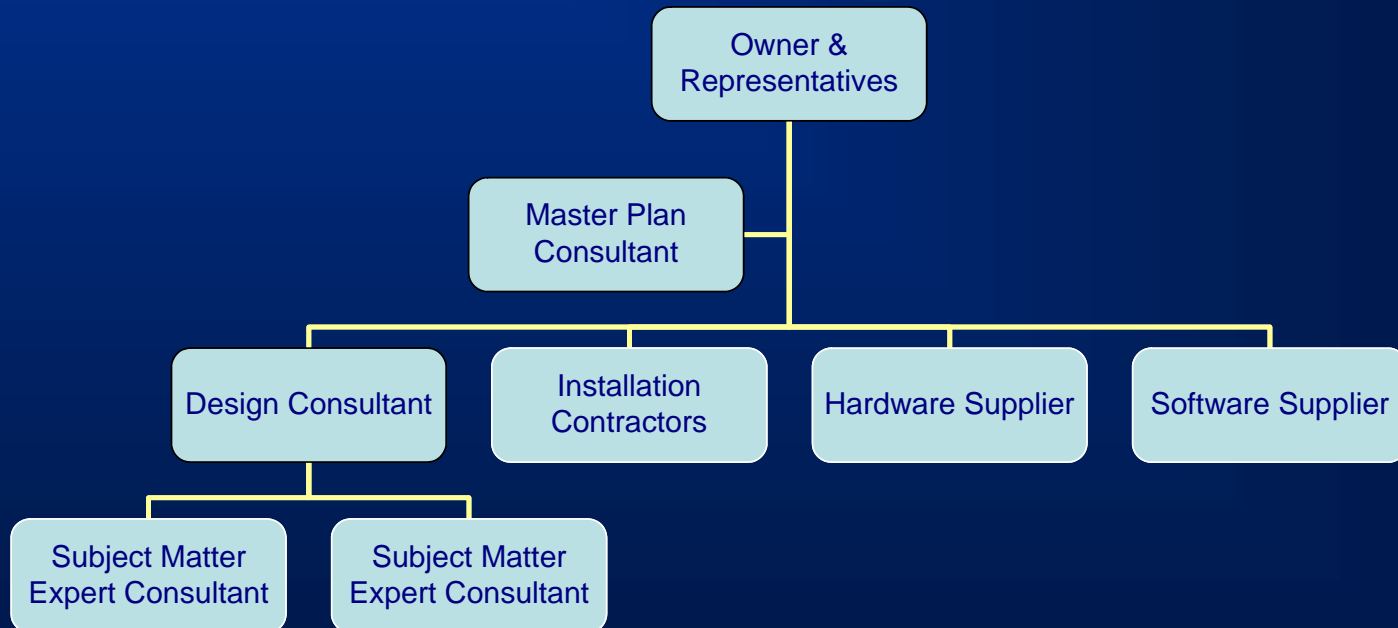


Project Delivery Comparisons



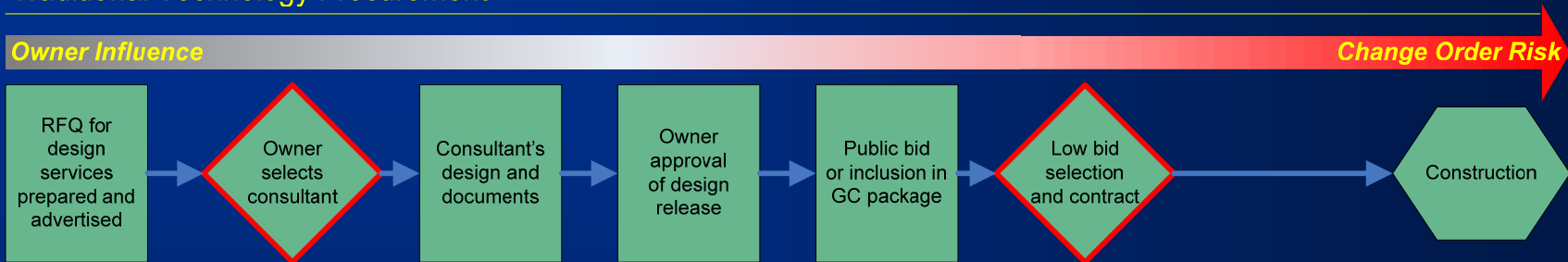
Design-Bid-Build Relationships

The traditional airport IT delivery system under which the owner holds separate contracts with designers, integrators and suppliers.



Process Flow for Traditional Design-Bid-Build

Traditional Technology Procurement



- Proceeds in a linear fashion
- Design completed before bidding
- Bidding completed before construction
- Long period of change order risk

When To Use Traditional DBB?

- Owner insists on check and balance control
- Schedule is not critical
- Lowest legal risk (More extensive case law)
- Technology systems are few or require minimal interoperability



DBB: Pros & Cons

Pros

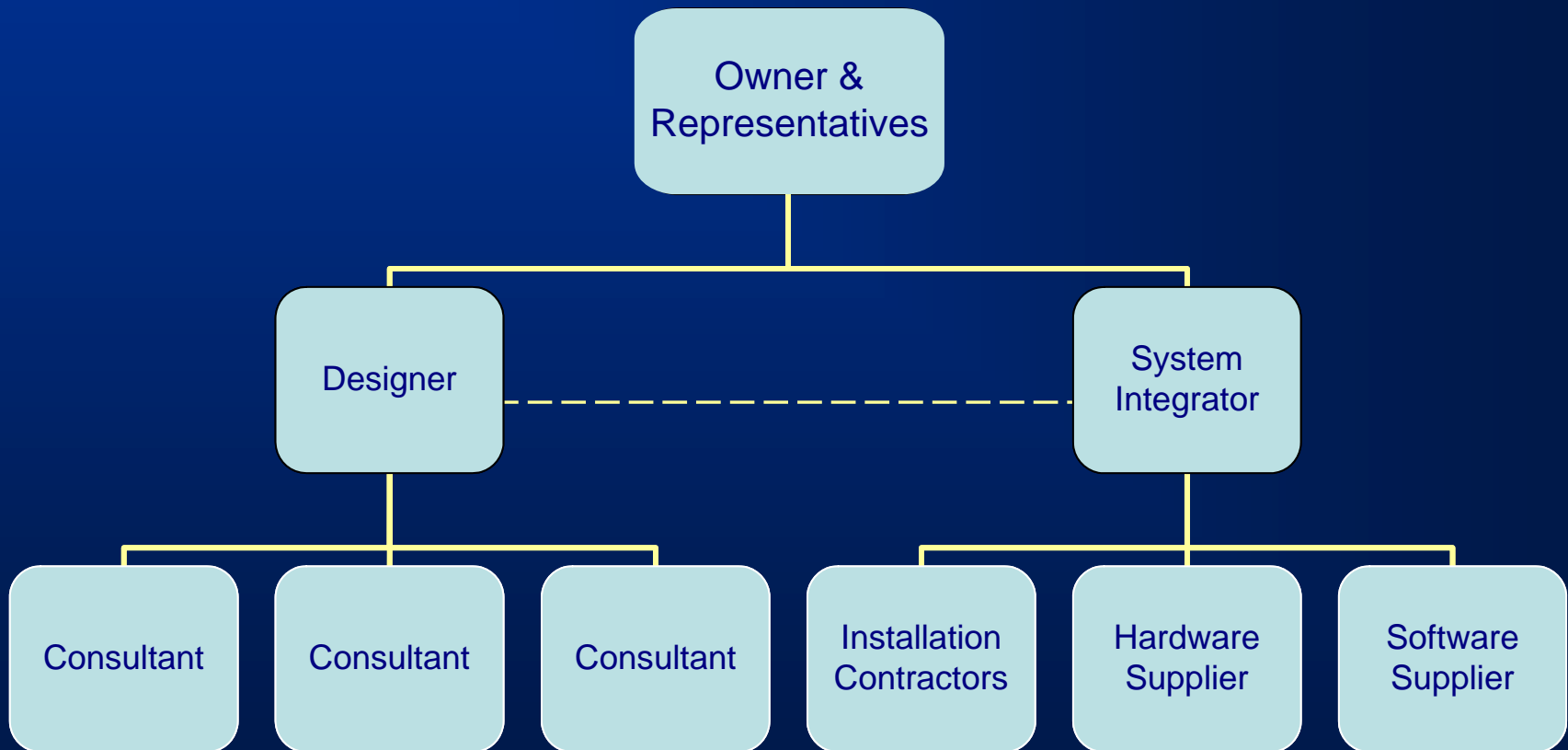
- Owner controls designer
- Clear, established process
- Familiar to staff
- Proven legal precedents

Cons

- Owner guarantees design
- Owner is referee
- Change orders can proliferate
- No incentive for creativity
- Longest duration
- Redesign is the only alternative to over-budget
- Low bid does not always give lowest cost

System Integrator (CM@Risk)

Owner holds separate contracts with a consultant and a system integrator.

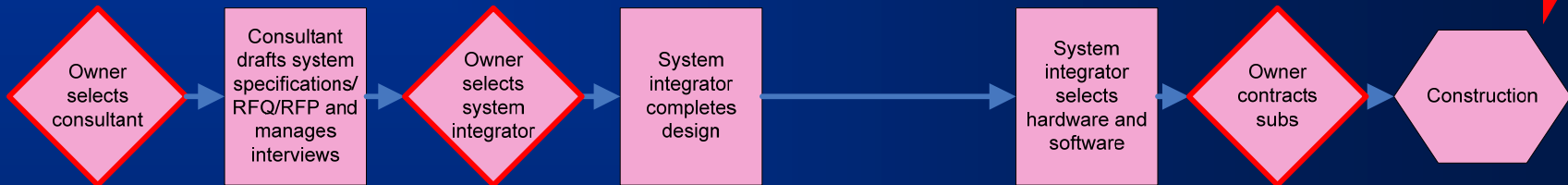


Process Flow for System Integrator

System Integrator

Owner Influence

Change Order Risk



- Earlier engagement of technical delivery firm
- Owner influence period somewhat is longer
- System integrator selects hardware and software
- System integrator may not have complete expertise
- Owner may need to execute subcontracts

When To Use System Integrator?

- Cash is tight and firm budget must be set
- There is an owner preference for a particular system
- Reduce confrontation between designer and builder
- Normal time constraints



System Integrator: Pros & Cons

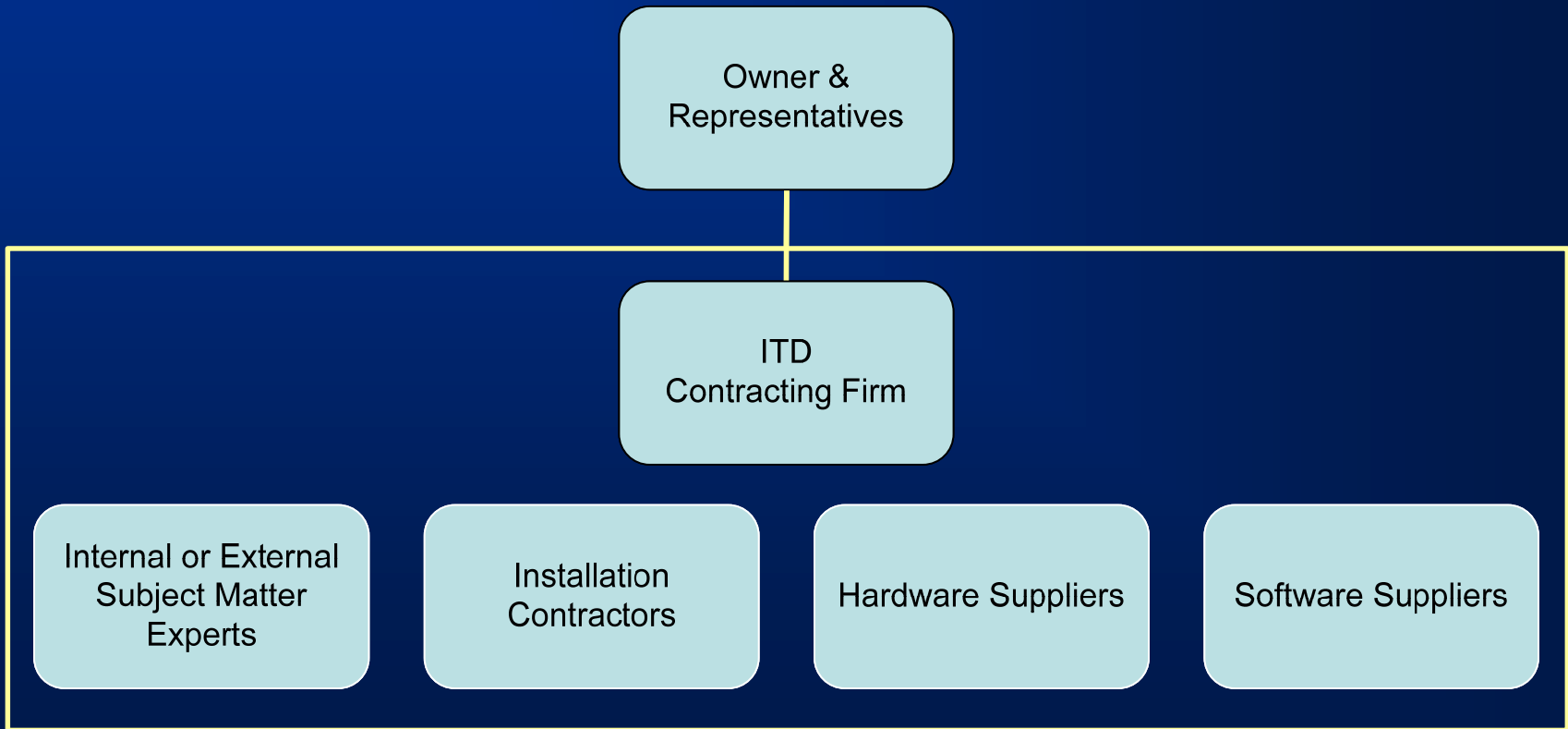
Pros

- Practical design with early system integrator involvement
- Owner has control of designer
- Open book or guaranteed maximum price
- Owner can influence selection of subcontractors
- Schedule reduction is possible

Cons

- Owner guarantees design to system integrator
- Owner is referee between designer and system integrator
- Guaranteed maximum price may be inflated (risk cost)
- Designer does not control the final system integrator design
- The system integrator supplies a major portion of components
- Best of breed is difficult to obtain

Owner holds a single contract with an entity comprising a committed group of partners for both design and delivery.





Integrated Project Delivery

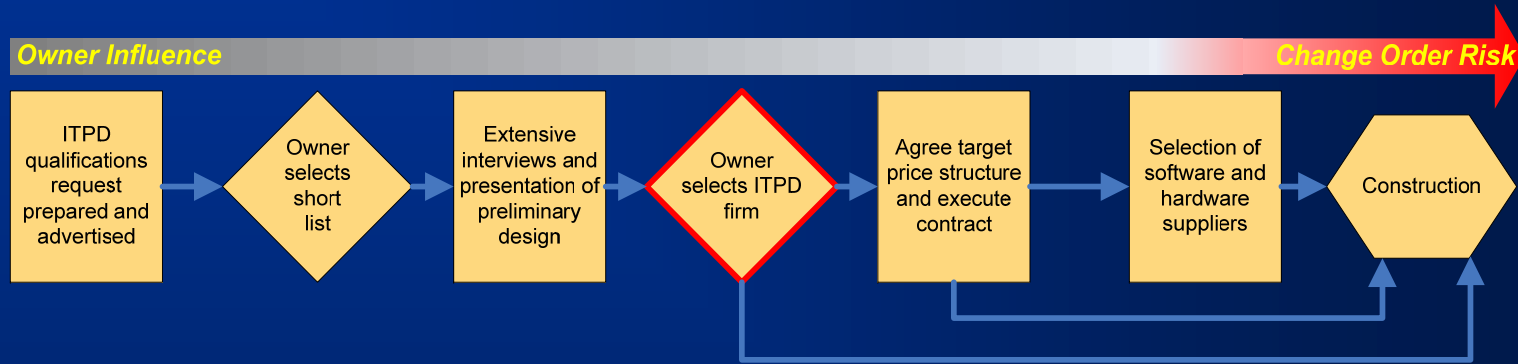
IPD was defined by the Lean Construction Institute in 2000 and adopted as a practice by AIA in 2007.

“IPD is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, construction and fabrication.”

Fundamental IPD Principles

- Define clear, specific project objectives early
- Allows for Total Cost of Ownership design
- Identify and use open standards
- Technology appropriate to the objective
- Enhance communication
- Select high performance products
- Everyone benefits from success – or not!
- Strong leadership rather than “management”

Process Flow for IPD



- Many activities can proceed concurrently
- Construction starts before design is complete
- Pricing occurs before and during design

When To Use IPD?

- Schedule compression is desired
- Budget must be aggressively controlled
- Single point of responsibility
- Quality and performance are mandatory
- Creative and innovative solutions are required

IPD: Pros & Cons

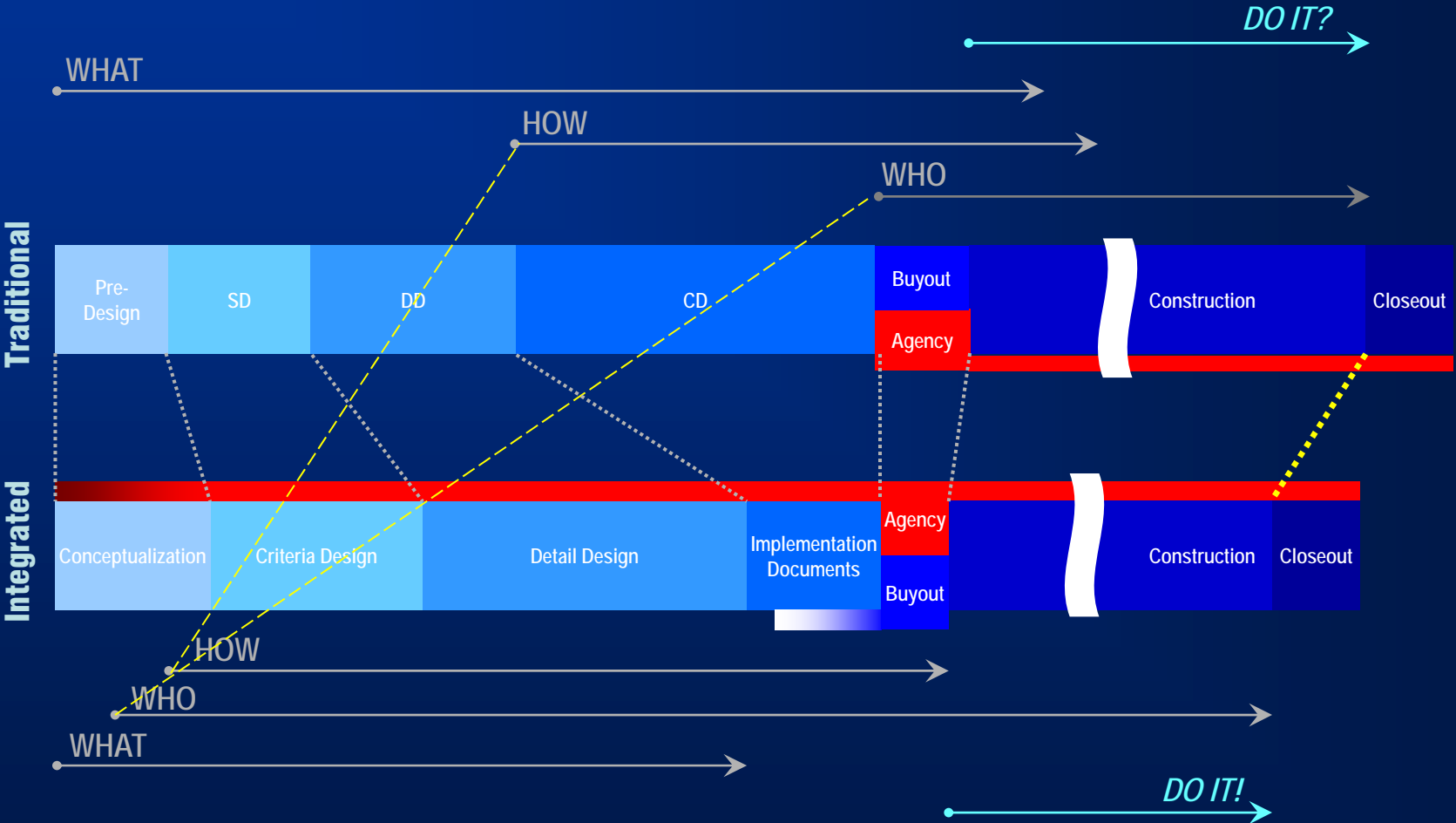
Pros

- True team integration
- IPD firm is a licensed contractor
- Greatest schedule compression
- Reasonable risk transfer
- Creative, state-of-the-art solutions
- Potential lower costs from innovation
- Owner does not guarantee design
- Trust and synergy within the delivery team are natural
- Better integration with other construction trades

Cons

- Qualification-based selection requires more owner effort
- Limited control of designer by owner
- Sometimes multiple solutions must be evaluated
- *Today*, limited case law
- *Today*, limited practical experience for both owners and industry

Comparing the Process



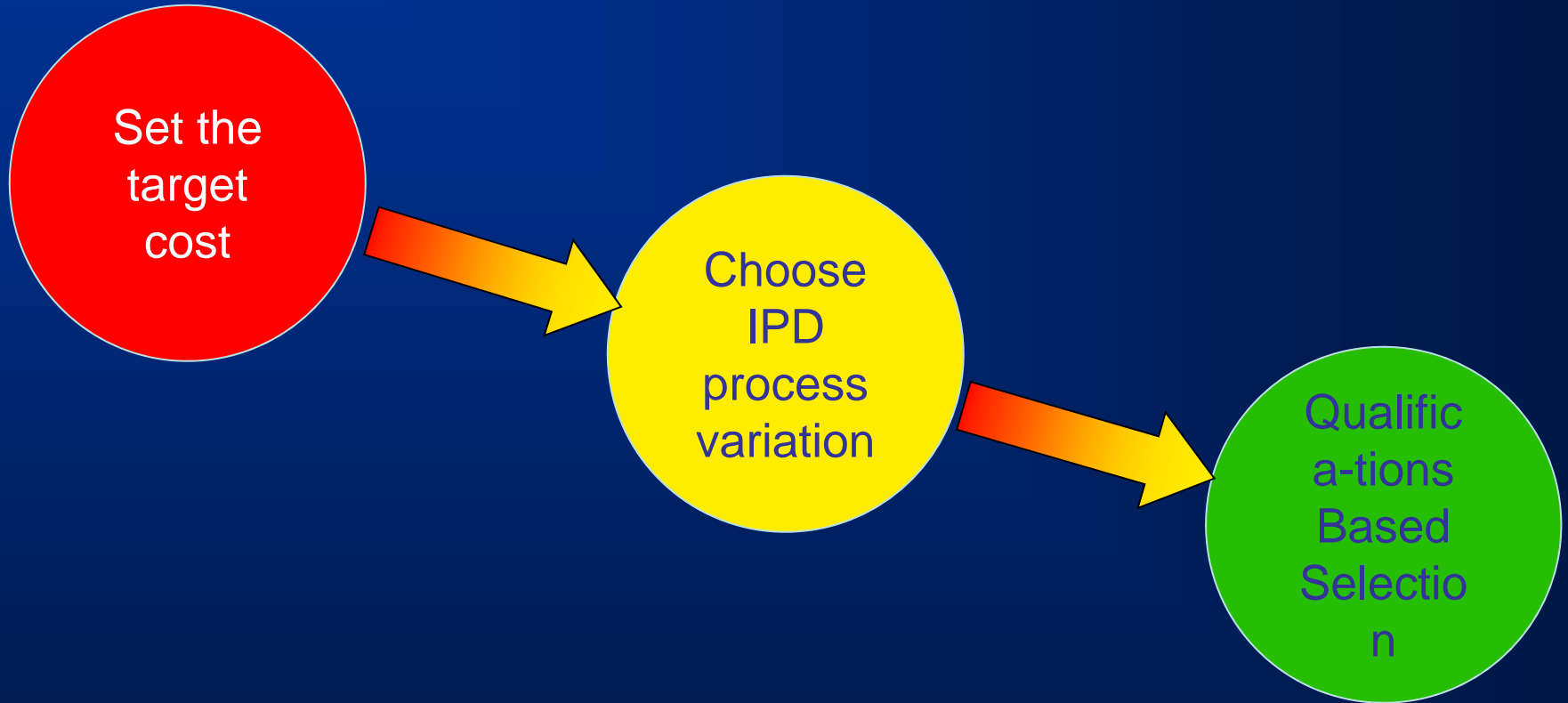
Variations on the IPD Theme

- **Progressive:** Owner provides design greater than 35%
 - Owner has more control
 - Liability concerns because IPD is asked to take risk for owner work
 - Less opportunity for cost control
 - Limited innovation by product specialists
- **Prescriptive:** Owner provides “some” design
 - Allows owner preferences on approach, technology and function
 - Somewhat reduced innovation and cost control
 - More accurate target cost
- **Performance-based:** Owner only states objectives
 - Does not dictate how to meet objectives
 - Provides IPD team with most flexibility
 - Innovative and cost effective solutions
 - Least accurate target cost with potential for lowest delivery cost

How Do You Do It?



The Big Steps



Set Realistic Target Cost

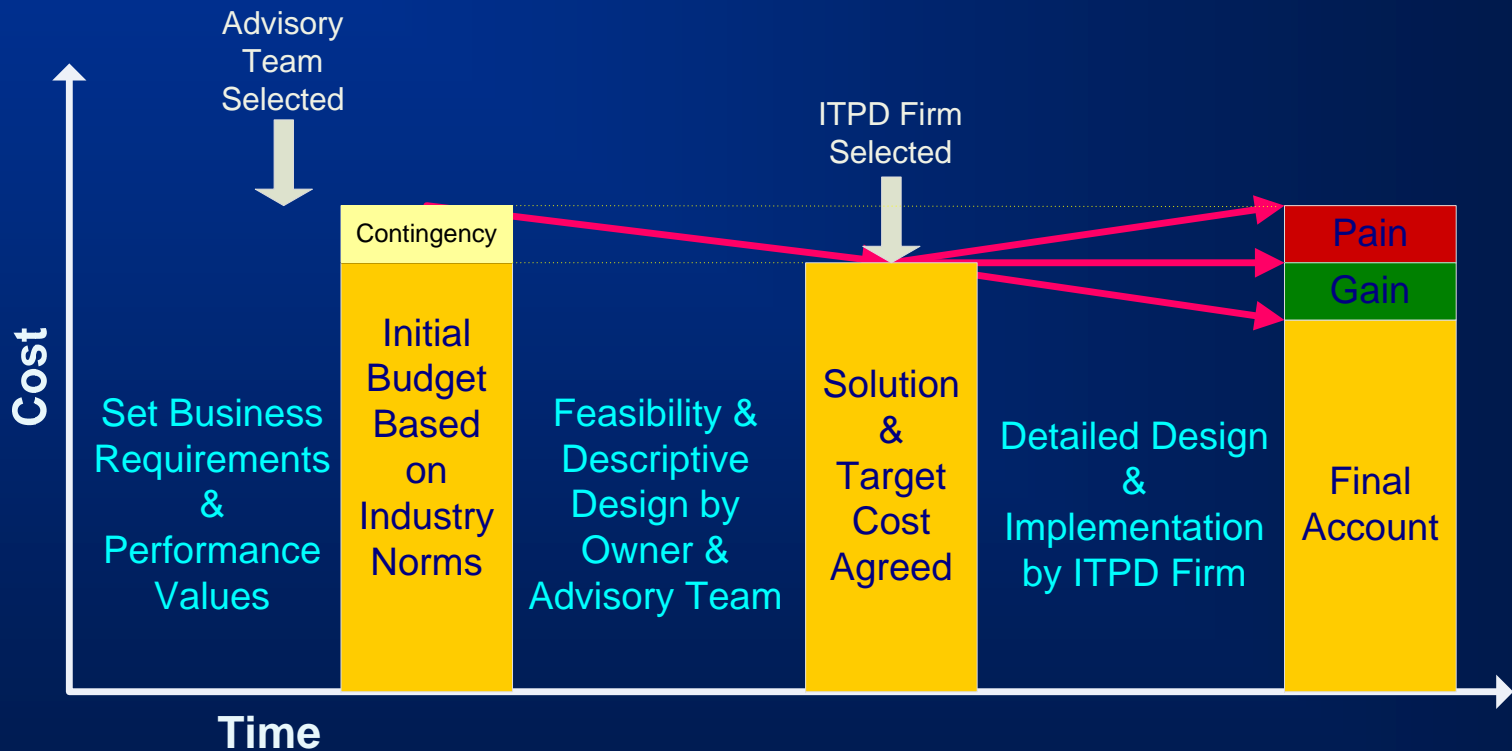
- If the target cost is unrealistically low, the ITD firms will be reluctant to respond.
- If the target cost is too high, you leave money on the table.
- A formula for sharing savings and cost increases is the best for all parties and makes the ITD firm a true partner with the owner.



Target Cost Details

- Determine financial criteria for the project from your business plan
 - minimum acceptable ROI
 - maximum available funds
- Decide who will manage the process (staff, PM, etc.)
- Determine and rank stakeholder values and establish systems scope to deliver them
- Determine the system cost based on current industry norms and comparables
- If this cost exceeds available funds or violates ROI, adjust scope by sacrificing lesser ranking values
- Set target cost below budget to drive innovation beyond current best practice.
- The difference between budget and target is contingency

Target Cost Process





Qualification-Based Selection Process

Phase 1: IPD Firm Qualifications

100 % Qualification

30% Project approach and organization

20% Technical competence

10% Staff experience

10% Company experience

5% Staffing plan

5% QA and safety plan

5% Strength of team relationships

10% Financial stability and capacity

5% Ability to control and meet schedules

Phase 2: Project Related Qualifications

100% Qualification

50% Cost of reference design

30% Risk

20% Quality

Creating a Successful IPD Project

- Laws and ordinances must allow QBS
- Set clearly defined objectives including target cost
- Establish a precise selection process
- Interview candidates carefully and in detail
- Engage an IPD firm early in process
- Define, understand and accept your risk as owner
- Establish an open interaction environment
- Initial owner design should be less than 30%
- Collaborate freely but limit formal design reviews
- Focus on Total Cost of Ownership (5-7 years)
- Use performance based requirements

A Few Ways to **Fail** at IPD

- Make scope changes during the selection process
- Force IPD teaming arrangements
- Focus on low initial prices
- Request best and final prices
- Insist on submittals and shop drawings
- Hold numerous status meetings and reviews
- Select a firm with insufficient financial strength



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On Time – On Budget – Better Results

Burns & McDonnell can do everything we have talked about today!



Who do you call?

Bret Pilney, PE

Vice President

(816) 822-3543

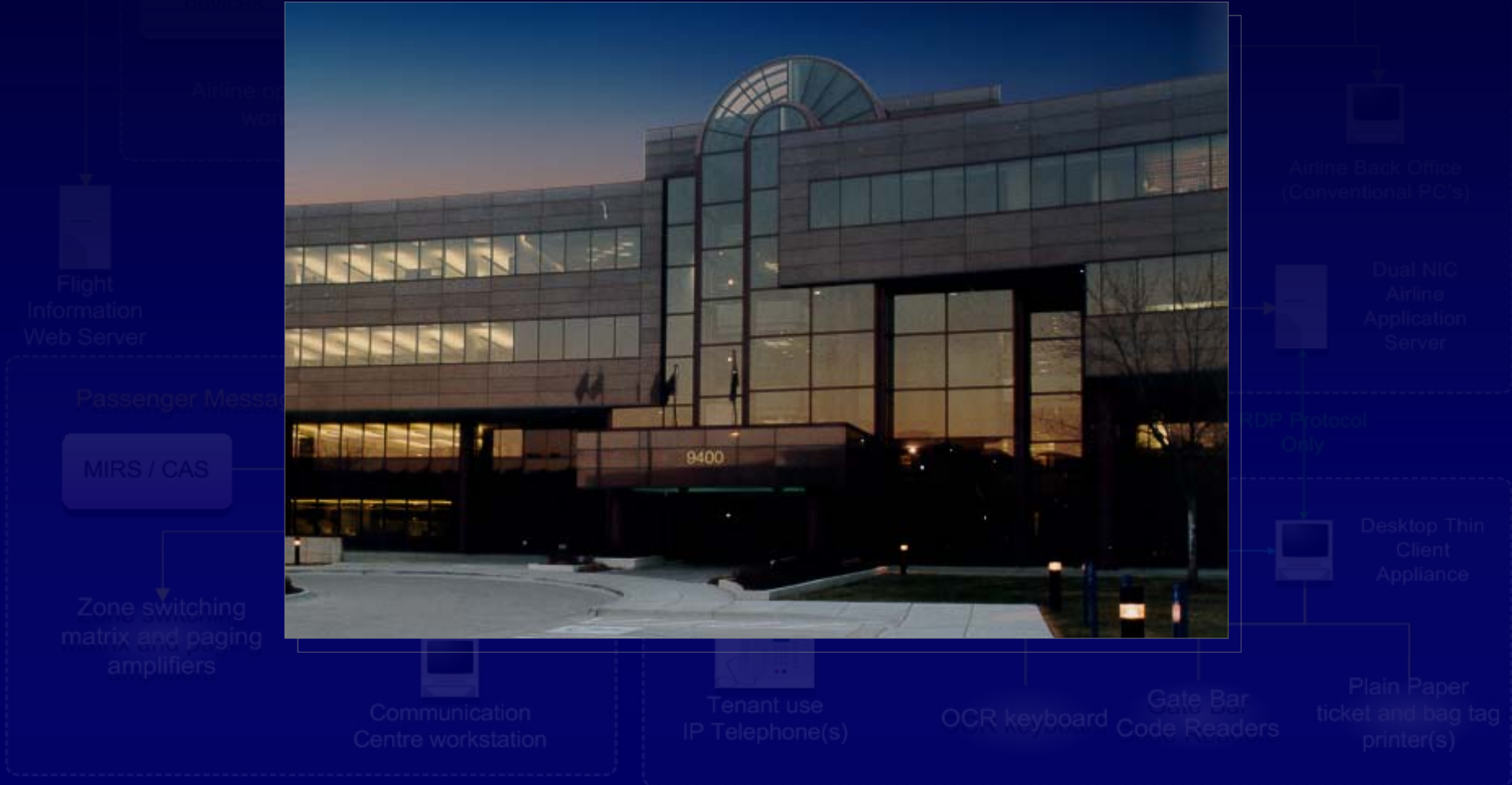
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Questions





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