

“People come to projects as friends  
and leave as enemies.”

(Fischer et al. 2017)

# Montos en juicios de la construcción alcanzan 54,9% del contrato original



Muchos de los problemas del sector de la construcción son originados por la inapropiada selección e ineficiente gestión del tipo de contrato.



(Toolanen & Olofsson, 2006).

La industria del diseño y la construcción necesita avanzar en el mejoramiento de la coordinación de los participantes del proyecto y la implementación de contratos colaborativos e integrados.





ESCUELA DE CONSTRUCCIÓN CIVIL  
FACULTAD DE INGENIERÍA

# *Una nueva mirada para el desarrollo de proyectos: Integrated Project Delivery*

Harrison Mesa H., Ph.D

Académico Escuela de Construcción Civil

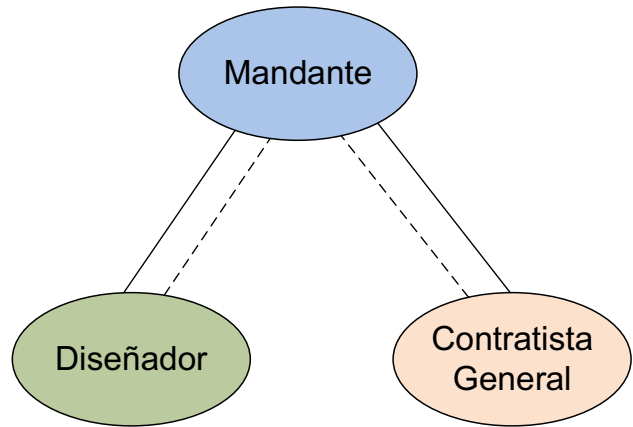
Pontificia Universidad Católica de Chile

2017

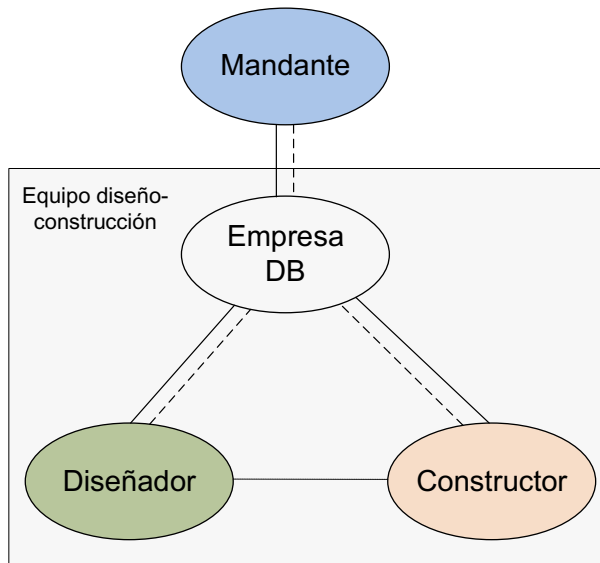
¿Qué es *Integrated Project Delivery*?

¿Por qué IPD produce mejores resultados?

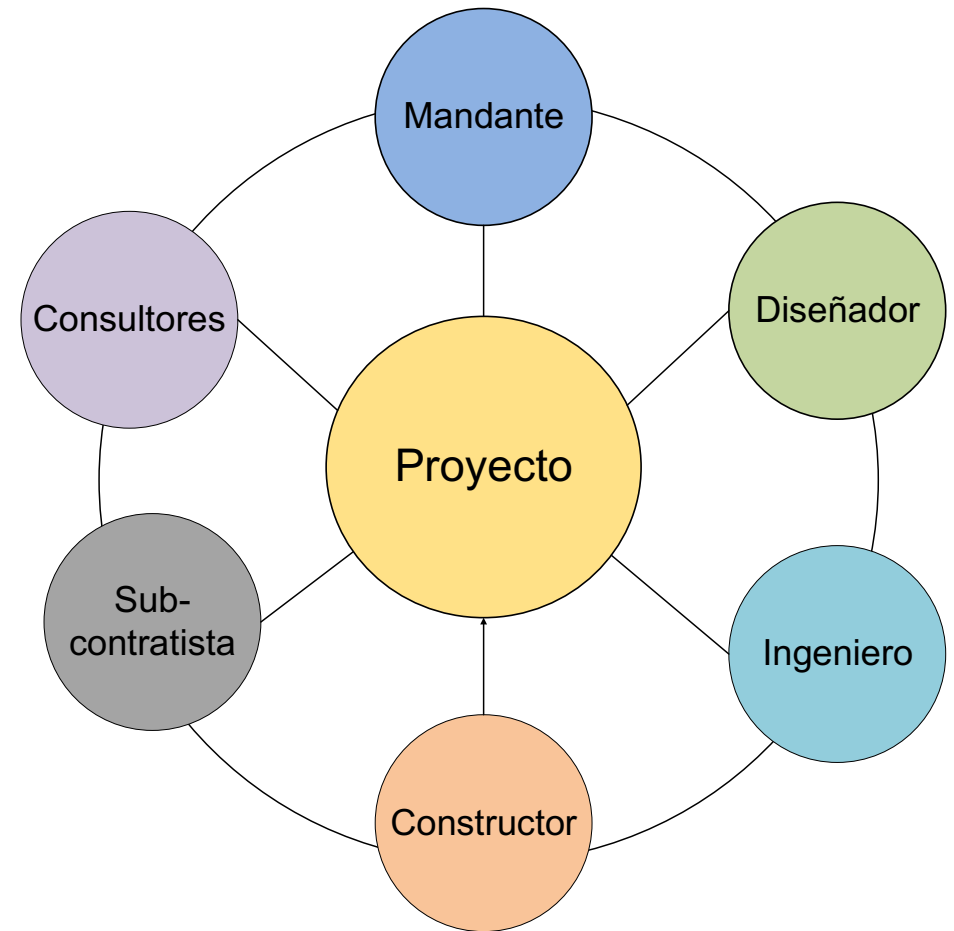
# Diseño – Licitación – Construcción



# Diseño – Construcción



# Integrated Project Delivery



Sutter Medical Center, Castro Valley

United

Devenney Group Ltd, Archit  
James W. M

TMAD TAYLOR & GAINES  
Edwin Najarian

The Engineering Enterprise  
Kristina Martin

Capital Engineering Consultants Inc.  
Bryan E. Johnson

Gha Associates  
Samir Emsa

Owner:  
Sutter Medical Center, Castro Valley  
By: [Signature]  
Name: Edward Bendick  
Title: Sutter Health Sr VP

Architect:  
Devenney Group Ltd, Architects  
By: JAMES W. MOBLEY  
Name: JAMES W. MOBLEY  
Title: CDO

CM/IGC:  
DPR Construction  
By: [Signature]  
Name: Eric R. Law  
Title: EVP

IFOA Design Consultant:  
Capital Engineering  
By: [Signature]  
Name: [Signature]  
Title: [Signature]

IFOA Design Consultant:  
TMAD Taylor & Gaines  
By: [Signature]  
Name: Edwin Najarian  
Title: Principal, V.P.

IFOA Design Consultant:  
The Engineering Enterprise  
By: [Signature]  
Name: KRISTINA MARTIN  
Title: PRINCIPAL

IFOA Trade Contractor:  
Morrow Meadows Corporation  
By: [Signature]  
Name: JAMES BOERTZ  
Title: V.P. / G.M.

IFOA Trade Contractor:  
Transbay Fire Protection, Inc.  
By: [Signature]  
Name: Julie Schmitt  
Title: Sec

IFOA Trade Contractor:  
J.W. McClellan Co.  
By: [Signature]  
Name: J.W. McClellan  
Title: President

IFOA Trade Contractor:  
Superior Air Handling  
By: [Signature]  
Name: AMYLA BURCH  
Title: Vice President

Process Consultant:  
Ghafari Associates, LLC  
By: [Signature]  
Name: K. G. Hanson  
Title: Prin + CEO



# ¿Qué es *Integrated Project Delivery*?

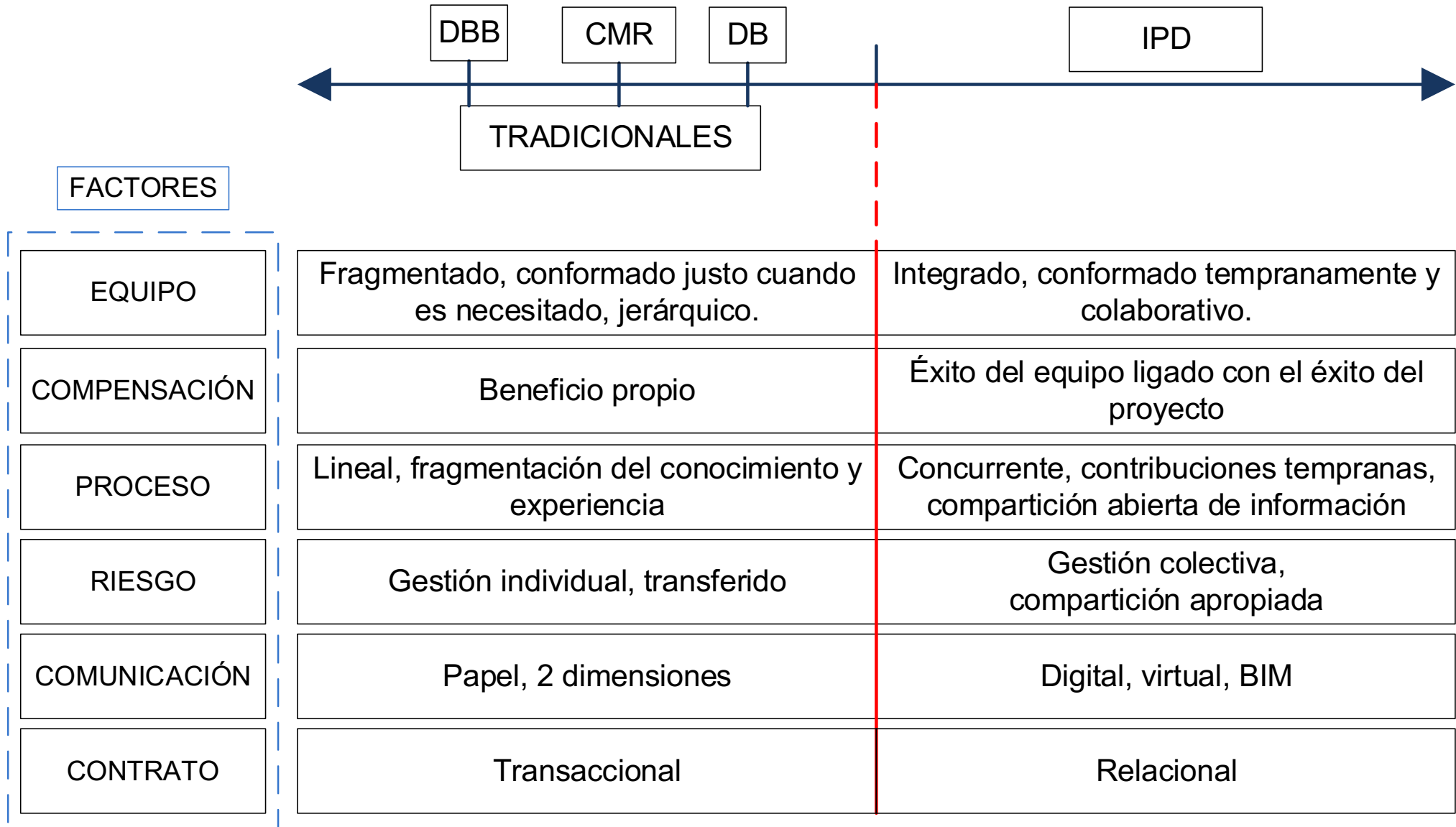
## Integración

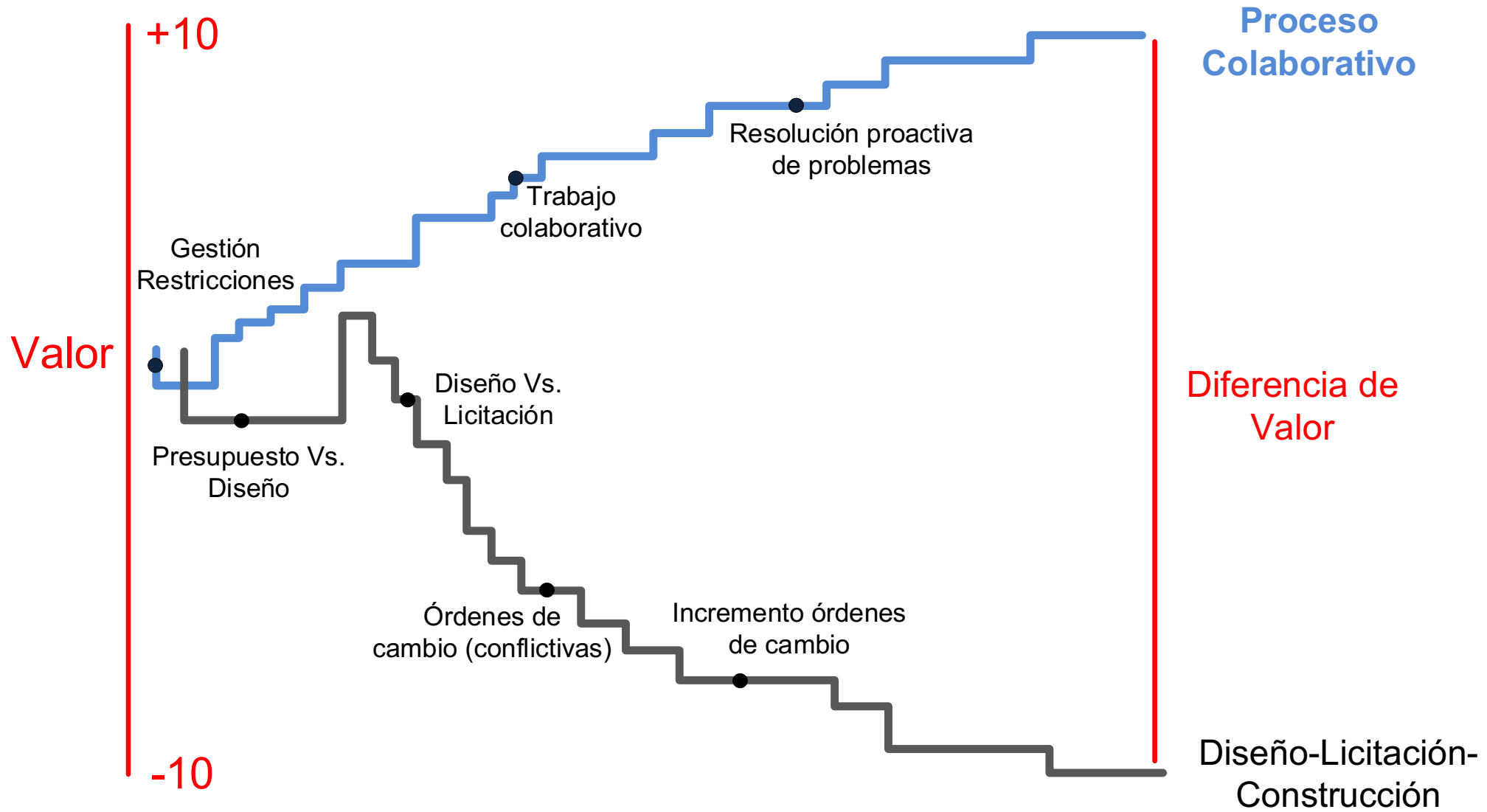
- Personas
- Estructuras de negocio
- Prácticas de gestión

## Contrato Relacional

- Multi – party

- Optimizar los resultados del proyecto
- Incrementar el **valor** del cliente
- Reducir pérdidas





VALOR = ALCANCE, CALIDAD, TIEMPO, COSTO

# Modeling Performance of Integrated Project Delivery Systems in Design and Construction



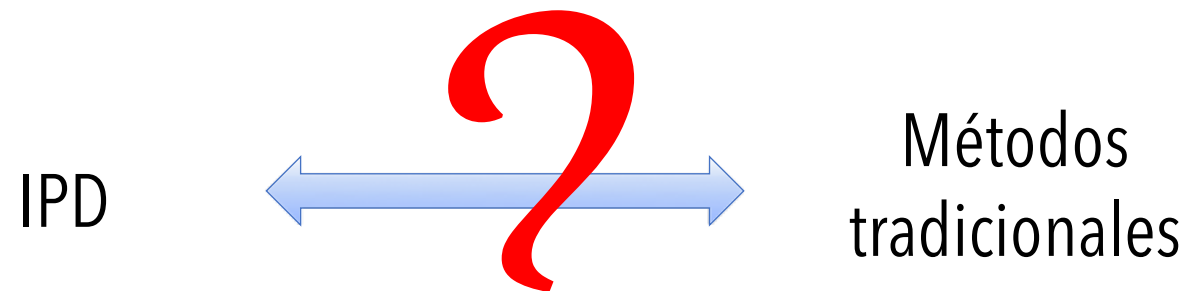
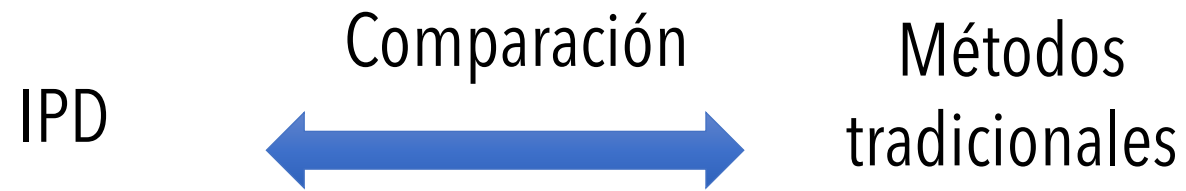
University of Colorado  
Boulder



Pontificia Universidad  
Católica de Chile

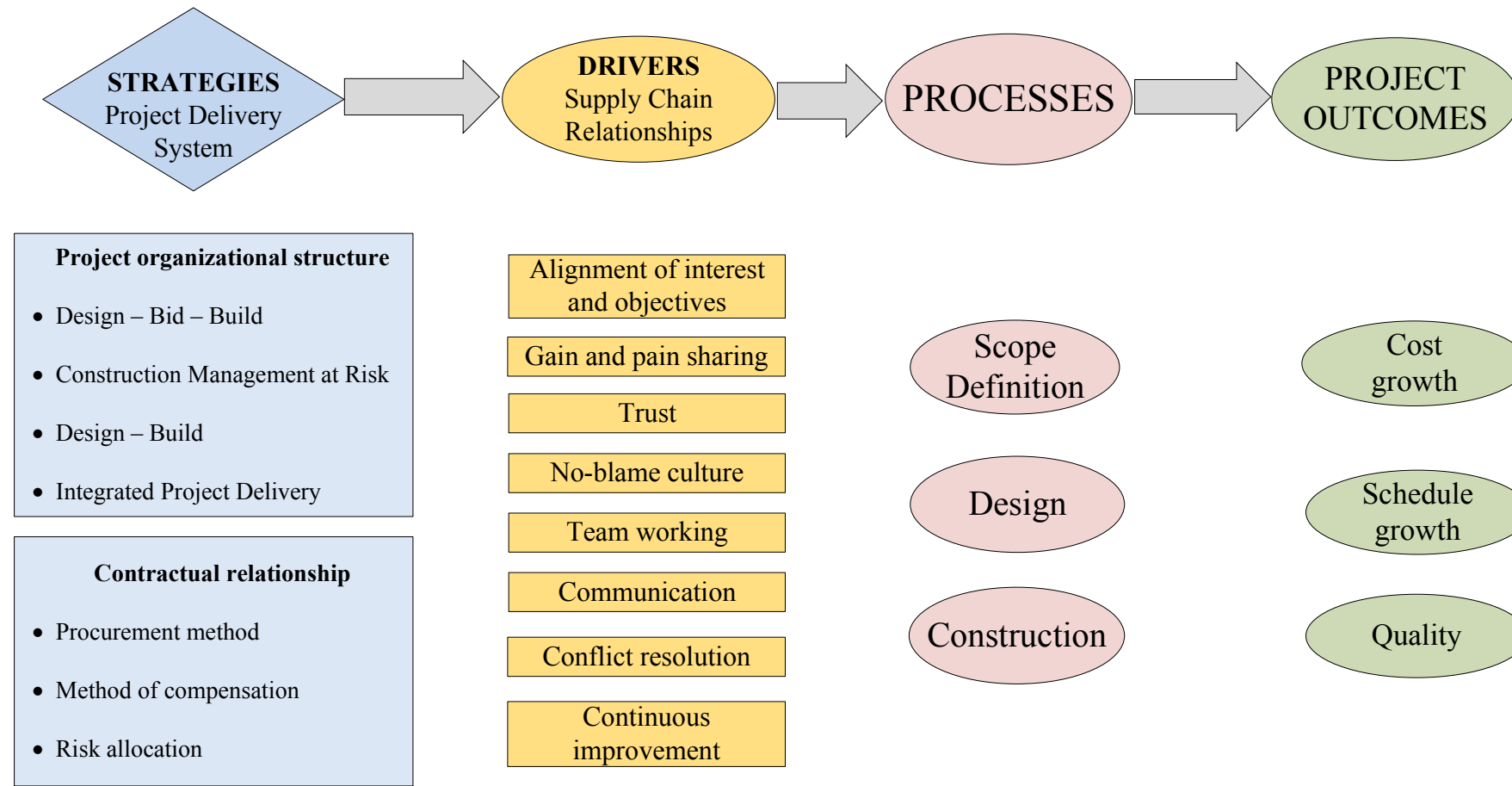
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# DESEMPEÑO



better

# Modelo conceptual



(Mesa et al. 2016)

# Participantes – Workshop

Role	Experience (Years)	Experience			
		DBB	CMR	DB	IPD
Architect	20	√	√	√	√
Consulting Engineer	23	√	√	√	√
Engineer	30	√	√	√	√
General Contractor	32	√	√	√	√
General Contractor	10	√	√	√	√
Mechanical Engineer	35	√	√	√	√
Private Owner	20	√	√	√	√
Private Owner	25	√	√	√	√
Public Owner	32	√	√	√	√

(Mesa et al. 2016)

# Workshop



<b>Project Characteristics</b>	
Project type	Healthcare
Location	Denver, Colorado
Size	430,000 sf
Project cost	\$ 160 Million



# Project delivery performance

Project Delivery System Strategy (1)	Project Delivery Systems				Project Cost (Millions) (6)	Project Schedule (Months) (7)	Project Quality (Index 1 to 10) (8)
	Type of Organizat. Structure (2)	Contractual Relationship					
		Procurement Method (3)	Compensation Method (4)	Risk Allocation (5)			
<b>DBB</b>	DBB	Low Bid	Fixed Price	Split	200	30	5
<b>CMR</b>	CMR	Qualification Based Selection	Guaranteed Maximum Price	Split	175	26	6
<b>DB</b>	DB	Qualification Based Selection	Guaranteed Maximum Price	Split	167	25	7
<b>IPD</b>	IPD	Qualification Based Selection	Target Price	Shared	149	22	8

26%

27%

(Mesa et al. 2016)



¿Por qué IPD produce mejores resultados?

# Análisis de sensibilidad

Driver	Cost	Schedule	Quality
Communication	16%	17%	16%
Alignment of interest and objectives	15%	14%	15%
Team working	14%	14%	14%
Trust	13%	13%	13%
Gain/Pain Sharing	13%	13%	13%
No-blame culture	12%	12%	12%
Continuous Improvement	9%	10%	10%
Conflict Resolution	7%	7%	7%

A mayor **impacto relativo** (porcentaje), mayor es el grado de sensibilidad del resultado del proyecto asociado al *driver*

(Mesa et al. 2016)

*“DBB is the worst strategy for communication, everything requires formal written Requests for Information.”*

	SUPPLY CHAIN RELATIONSHIP FACTORS							
	Alignment of interests and objectives	Gain and pain sharing	Trust	No-blame culture	Team working	Communication	Conflict resolution	Continuous improvement
Design-Bid-Build	N	NN	NN	N	N	NN	NN	O
Construction Management at Risk	O	NN	O	N	O	O	N	O
Design-Build	O	O	O	N	O	O	N	O
Integrated Project Delivery	P	PP	P	P	P	P	P	P

High positive (PP)    Positive (P)    No effect (O)    Negative (N)    High negative (NN)

*“CMR is better than DBB because contractor is there early; decisions I make as designer have input from contractor.”*

PROJECT ORGANIZATIONAL STRUCTURE	SUPPLY CHAIN RELATIONSHIP FACTORS							
	Alignment of interest and objectives	Gain and pain sharing	Trust	No-blame culture	Team working	Communication	Conflict resolution	Continuous improvement
Design-Bid-Build	N	NN	NN	N	N	NN	NN	O
Construction Management at Risk	O	NN	O	N	O	O	N	O
Design-Build	O	O	O	N	O	O	N	O
Integrated Project Delivery	P	PP	P	P	P	P	P	P

High positive (PP)    Positive (P)    No effect (O)    Negative (N)    High negative (NN)

*“DB is better for potential sharing pain and gain due to the single contract between the designer and constructor. However, DB is still contractually similar to CMR because of the split in risk.”*

PROJECT ORGANIZATIONAL STRUCTURE	CONTRACTORS							
	Alignment of interest and objectives	Gain and pain sharing	Trust	No-blame culture	Team working	Communication	Conflict resolution	Continuous improvement
Design-Bid-Build	N	NN	NN	N	N	NN	NN	O
Construction Management at Risk	O	NN	O	N	O	O	N	O
Design-Build	O	O	O	N	O	O	N	O
Integrated Project Delivery	P	PP	P	P	P	P	P	P

High positive (PP)    Positive (P)    No effect (O)    Negative (N)    High negative (NN)

*“I think there can be no better alignment for these three things (communication, joint goal setting, and pain and gain sharing; how much more aligned can you get?”*

PROJECT ORGANIZATIONAL STRUCTURE	SHIP FACTORS								
	Alignment of interest and objectives	Gain and pain sharing	Trust	No-blame culture	Team working	Communication	Conflict resolution	Continuous improvement	
Design-Bid-Build	N	NN	NN	N	N	NN	NN	O	
Construction Management at Risk	O	NN	O	N	O	O	N	O	
Design-Build	O	O	O	N	O	O	N	O	
Integrated Project Delivery	P	PP	P	P	P	P	P	P	

High positive (PP)    Positive (P)    No effect (O)    Negative (N)    High negative (NN)

- La selección adecuada del tipo de “*contrato*” es una de las decisiones estratégicas más importantes para alcanzar el éxito del proyecto.
- La adopción de IPD requiere un cambio del modelo de negocio, de las relaciones contractuales y del comportamiento de los participantes del proyecto.





¡Muchas gracias!

“People come to projects as friends  
and leave as friends.”