



# Herramientas de Productividad en Gerencia de Proyectos

*CARLOS ORTEGA DÁVILA*

**FAVOR USAR EL MICRÓFONO PARA  
TODAS LAS PREGUNTAS  
Y COMENTARIOS!**



AACE International  
[www.aacei.org](http://www.aacei.org)

**AACE**  
INTERNATIONAL



- Ingeniero Civil
- Maestría en Gerencia de Proyectos e Innovación en Ingeniería
- MBA con Énfasis en Gerencia de Proyectos y Mejores Prácticas
- 15 años de experiencia en América Latina y Australia
- *“Algo que no saben de mi”*

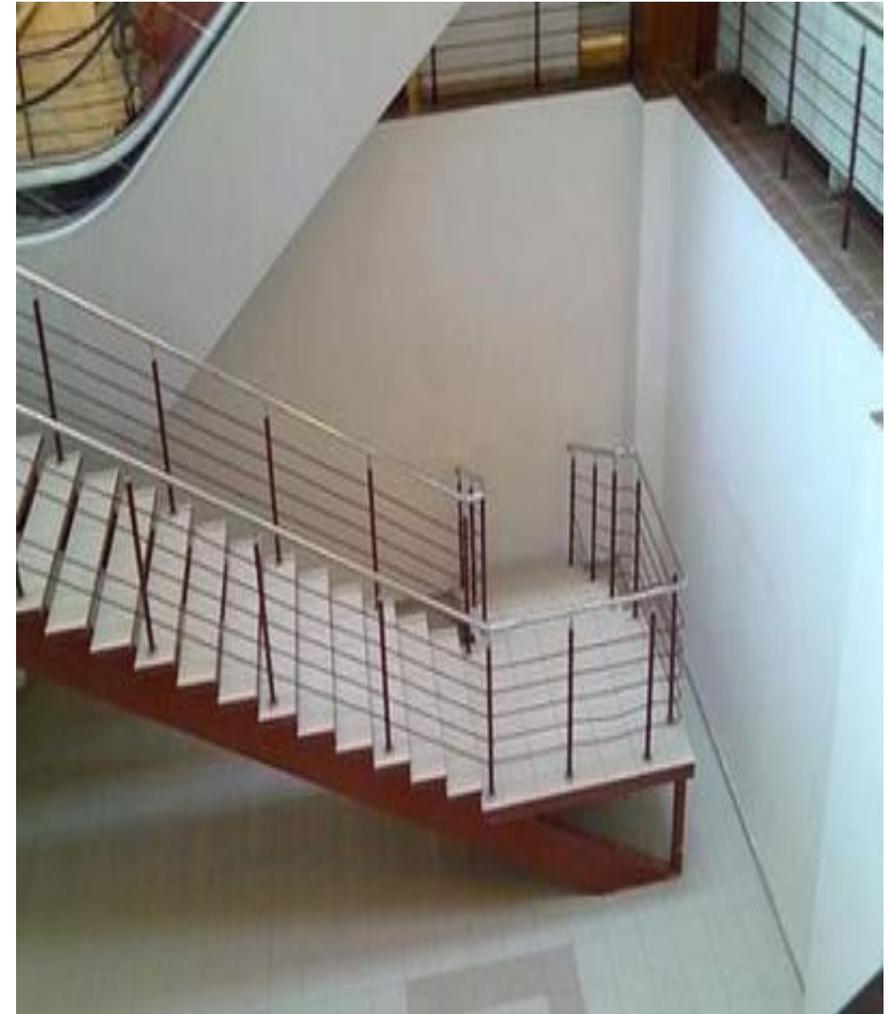
Tengo una fundación donde trabajamos en resocialización de presos en cárceles de Colombia.





¿Alguna vez le ha ocurrido o ha visto cosas así en proyectos de construcción?









**“Importa no sólo lo que se produce, también la calidad de la gerencia.”**

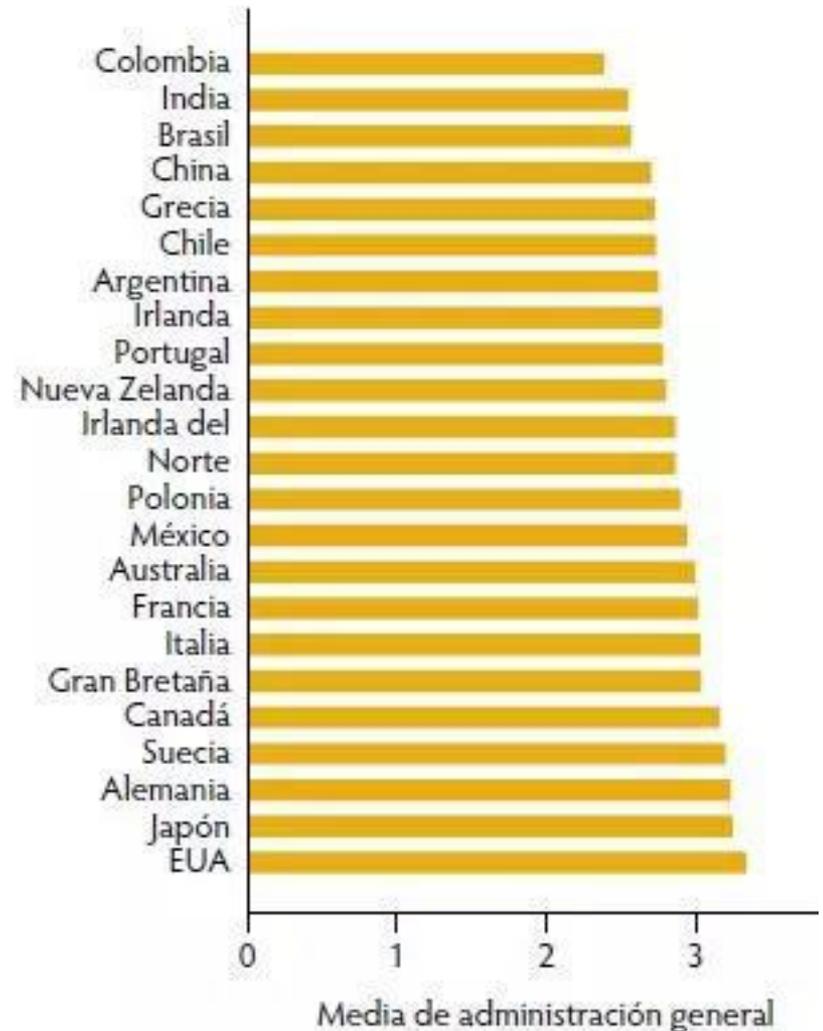
[Refiriéndose a Colombia]

**William Maloney**

Banco Mundial

Revista Dinero, Abril 22 de 2015

El problema en Colombia, según el Banco Mundial, es la falta de implementación y articulación de procesos de alta gerencia en las actividades de las diferentes industrias en el país.



**No estoy asociado con ninguna de las marcas  
que voy a mostrar.**

**Son simplemente buenas prácticas de la  
industria, pero existen muchas otras.**

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# Gestión Documental Y colaboración

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aconex | Hotel VIP Resort | Majestic Builders | Mr Patrick O'Leary | Logout | -- Cross Project Search --

Tasks Documents Mail Tenders Workflows Directory Setup

### Upload Document

Upload

Document No *	ELEC-0002	Auto-number	Revision *	A
Title *	Lighting Layout - Main Lobby		Type *	Drawing
Status *	Approved		Discipline *	Electrical
Building Zone	Events Centre		Work Package	
Confidential	<input type="checkbox"/>		File	Browse...
Print Size			Revision Date *	02/08/2010
Created By	Majestic Builders		Comments	

aconex

Manage subcontractor submissions

Required by: **Majestic Project & Construction Management Limited**

Send to \*

Patrick O'Leary - Majestic Builders

Transmittal Template [View/Edit](#)

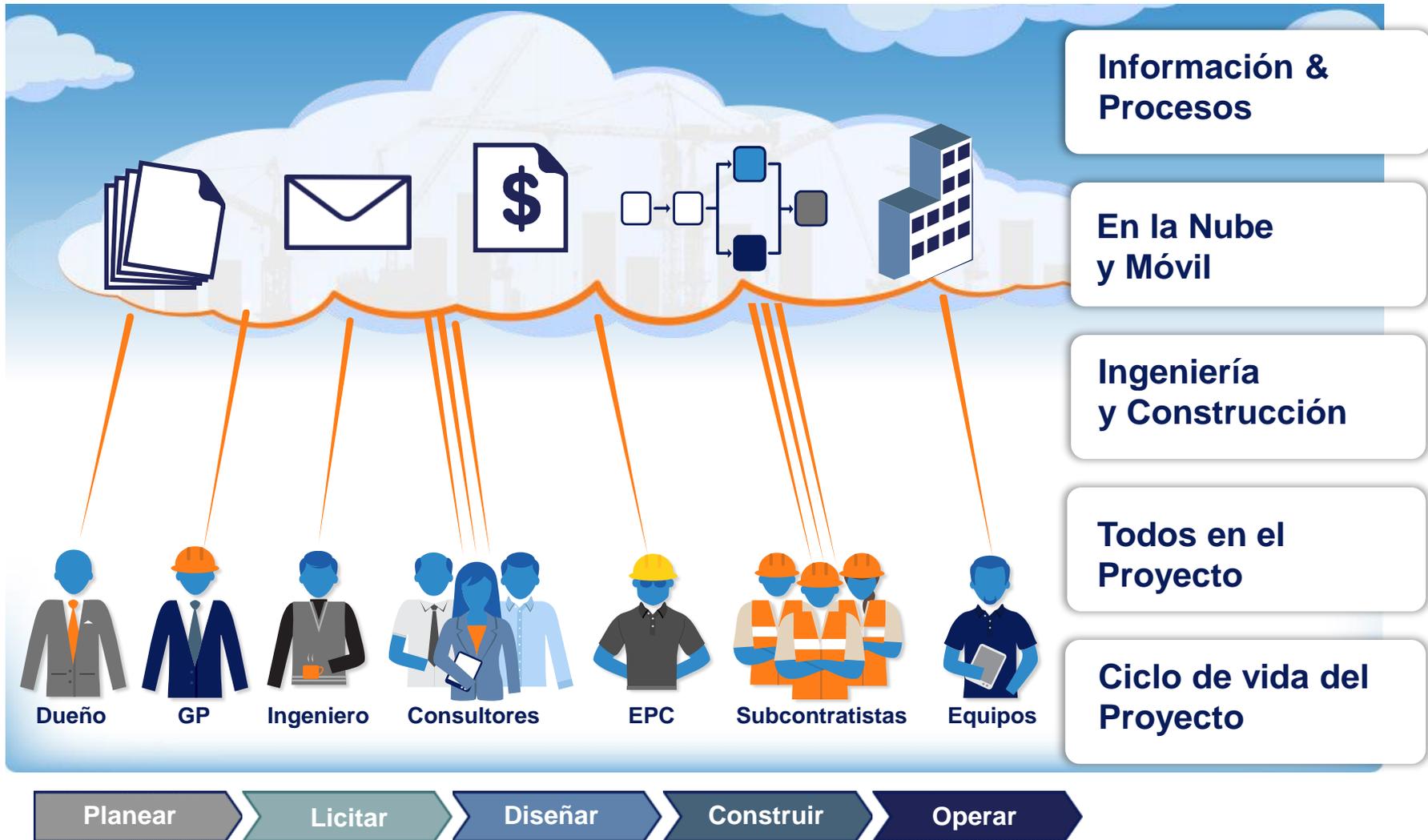
Turnaround \* 10 days to review documents

Total Documents 17

Progress Summary

Not Started	5 (29%)	<div style="width: 29%;"></div>
Submission Required	1 (6%)	<div style="width: 6%;"></div>
Submitted	6 (35%)	<div style="width: 35%;"></div>
Completed	5 (29%)	<div style="width: 29%;"></div>

Complete visibility of progress





Nueve de los top 10  
EPCs globales

23 de ENR Top 25  
firmas de diseño  
globales

Todas las empresas  
construcción e  
ingeniería del  
Fortune 500

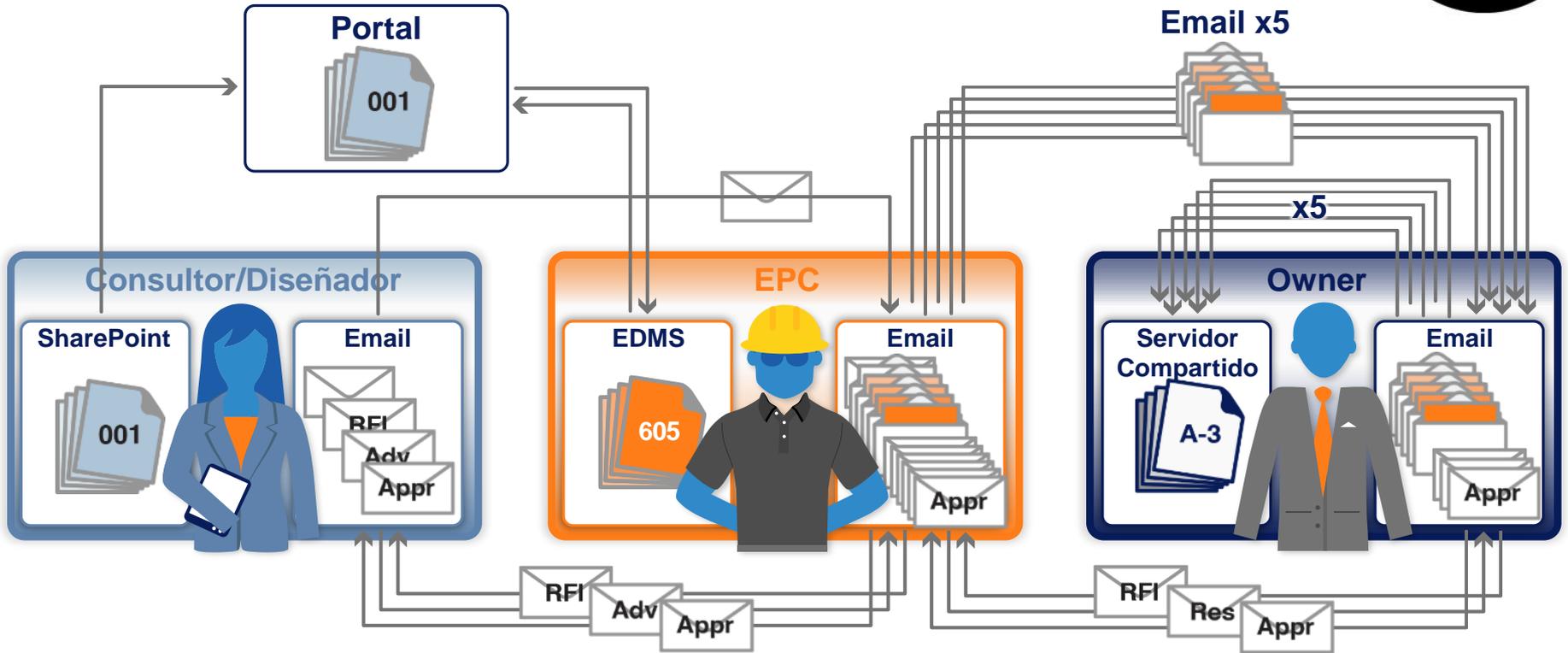


500,000 usuarios

US\$1.0 Tr en proyectos

70 países

# Proceso actual de Colaboración



**Pobre control de información**



**Docs en un lugar, decisiones en otro**



**Registro de auditoría incompletas**



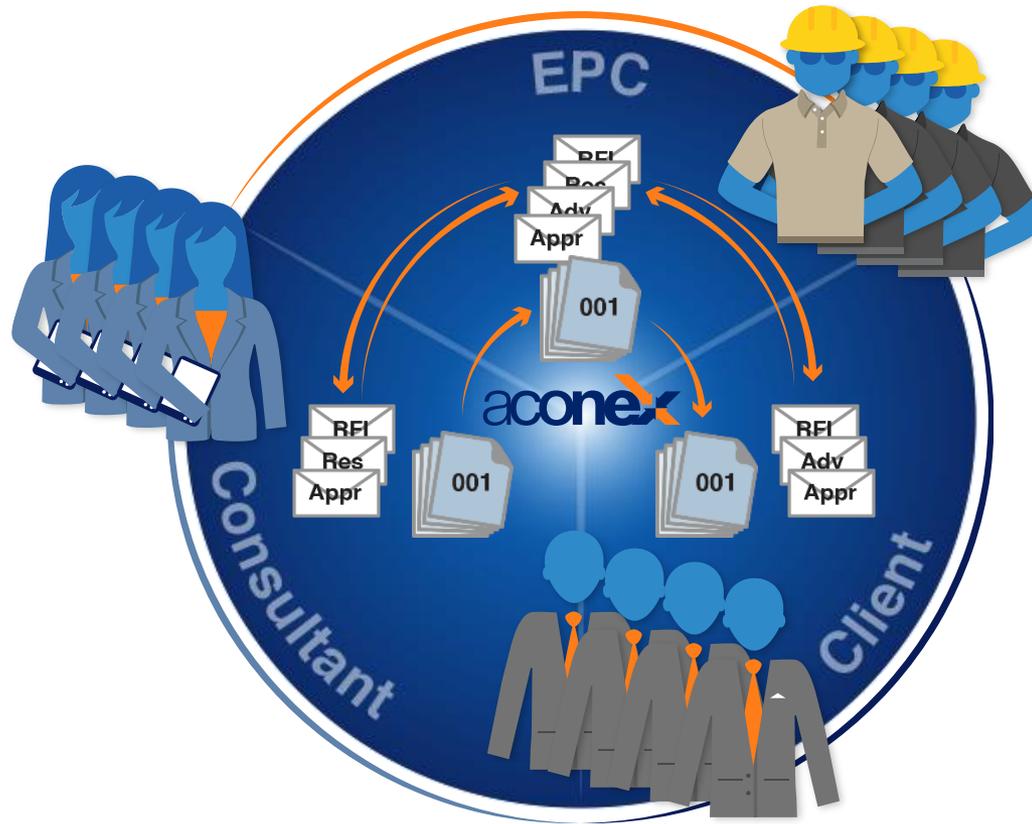
**Redigitación múltiples veces**



**Información perdida o difícil de encontrar**



**No hay trazabilidad en todo el proyecto**



**Control de Información en todo el proyecto**



**Docs y decisiones en un solo sitio**



**Trazabilidad de auditoría completa**



**Digitación única de documentos**



**Búsqueda fácil. No información perdida**



**Monitoreo de estado y progreso**



# Minimizar Riesgos, Maximizar Retornos

## Casos de Éxito:

Revisiones de diseño aceleradas  
68% mas rápido que usando FTP  
para un proyecto de US\$800m

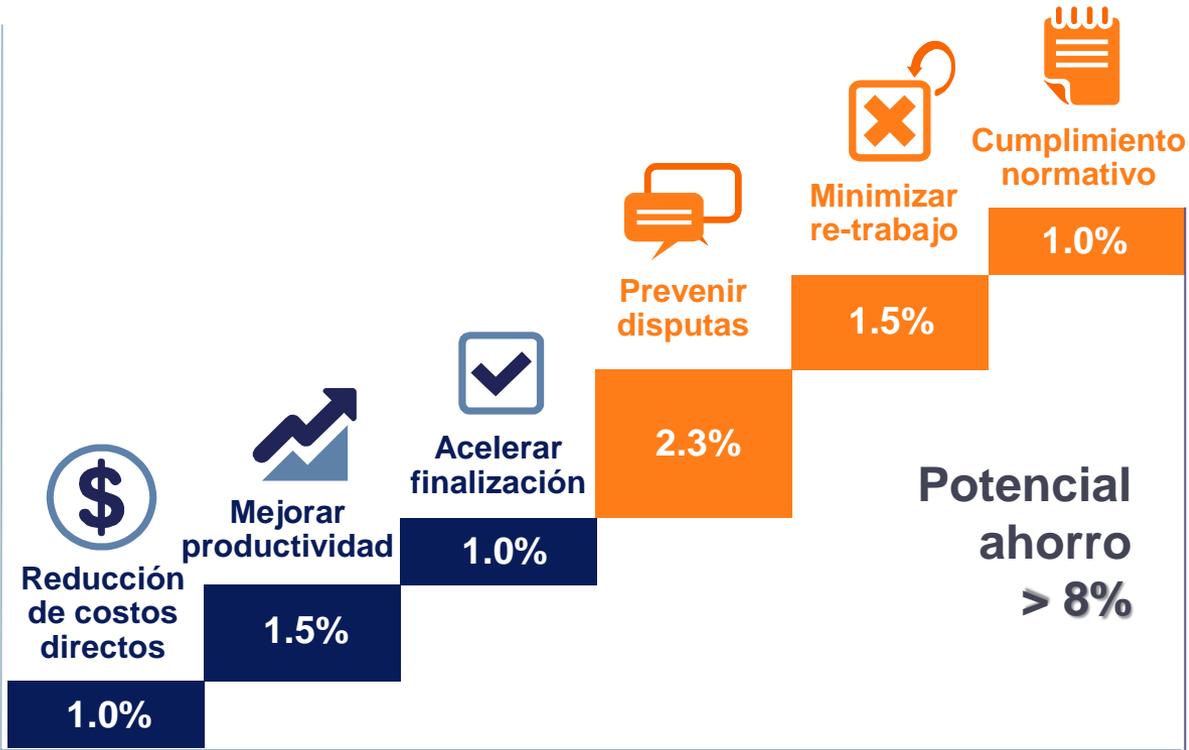
Control eficiente de documentos  
84% (US\$628,000) ahorrado vs.  
en proyecto de US\$268M

Agilidad en respuesta a RFIs  
43% más rápido que el promedio  
de la industria en EEUU

Mayor agilidad en licitaciones  
50% de ahorro en tiempo  
comparado con licitaciones previas

Tiempo de búsqueda reducido  
60% vs. Sistema interno,  
Constructor en proy. de US\$100M

Efficiente cumpl. de procesos  
80% ahorro de tiempo vs.  
Metodologías de procesos previos

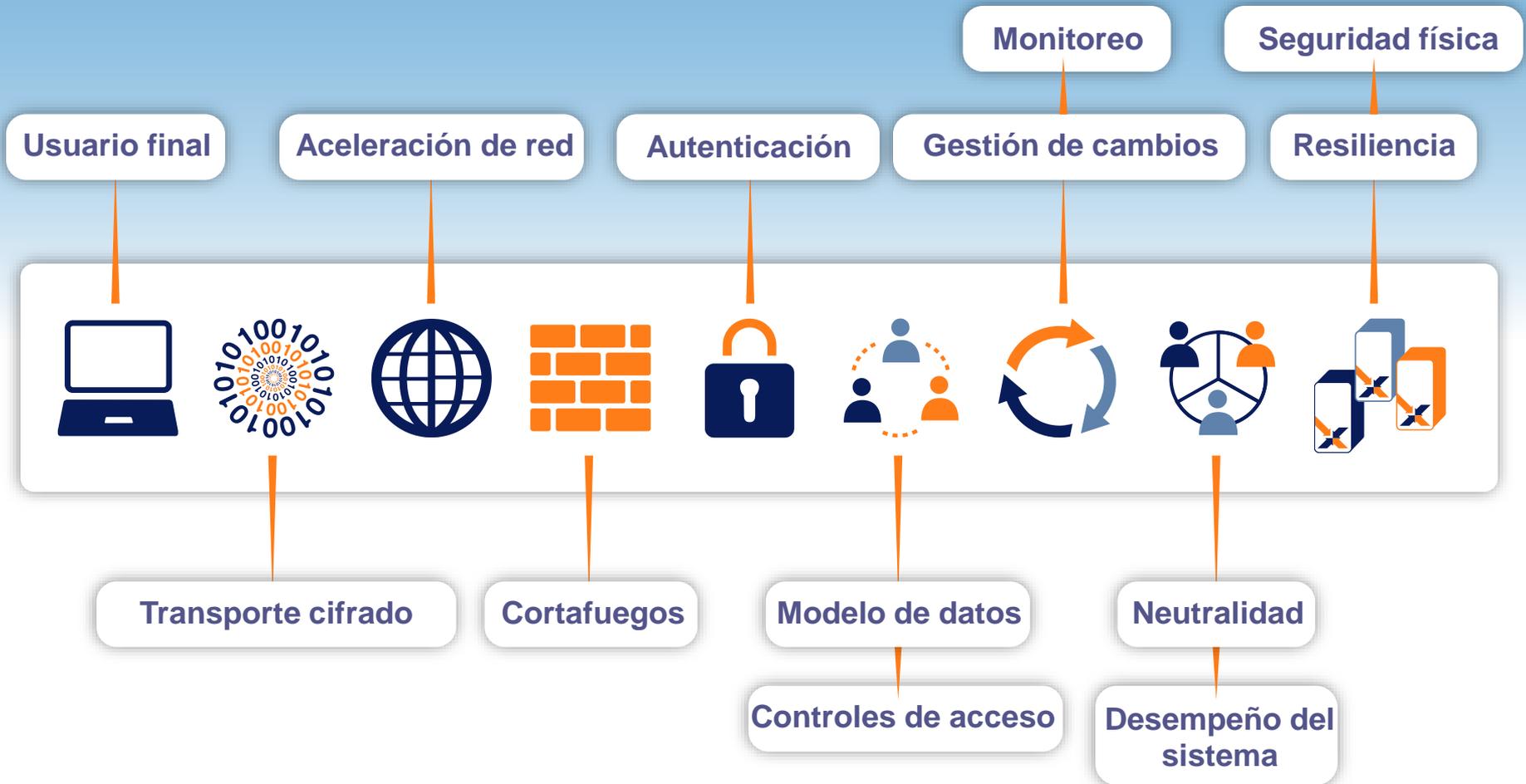


Maximizar Retorno

Minimizar Riesgos



## Certificación ISO 27001





Inspection and Issue Capture  
Client / Contractor

# BIM

## Building Information Modelling

*Modelación Multidimensional Parametrizada*

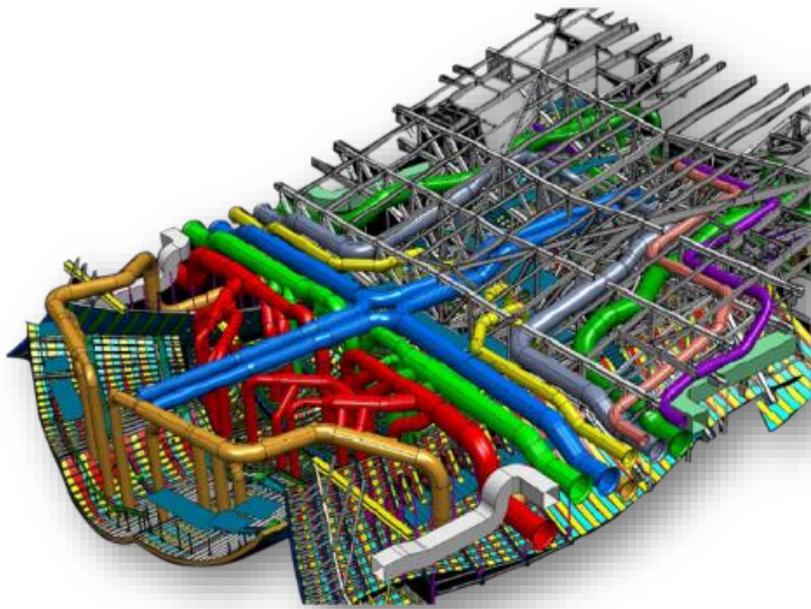
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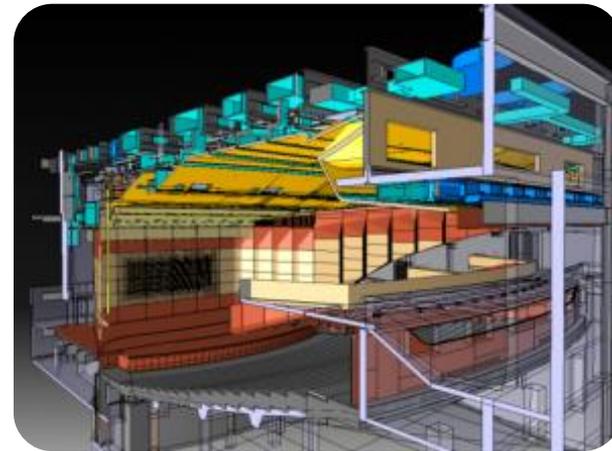


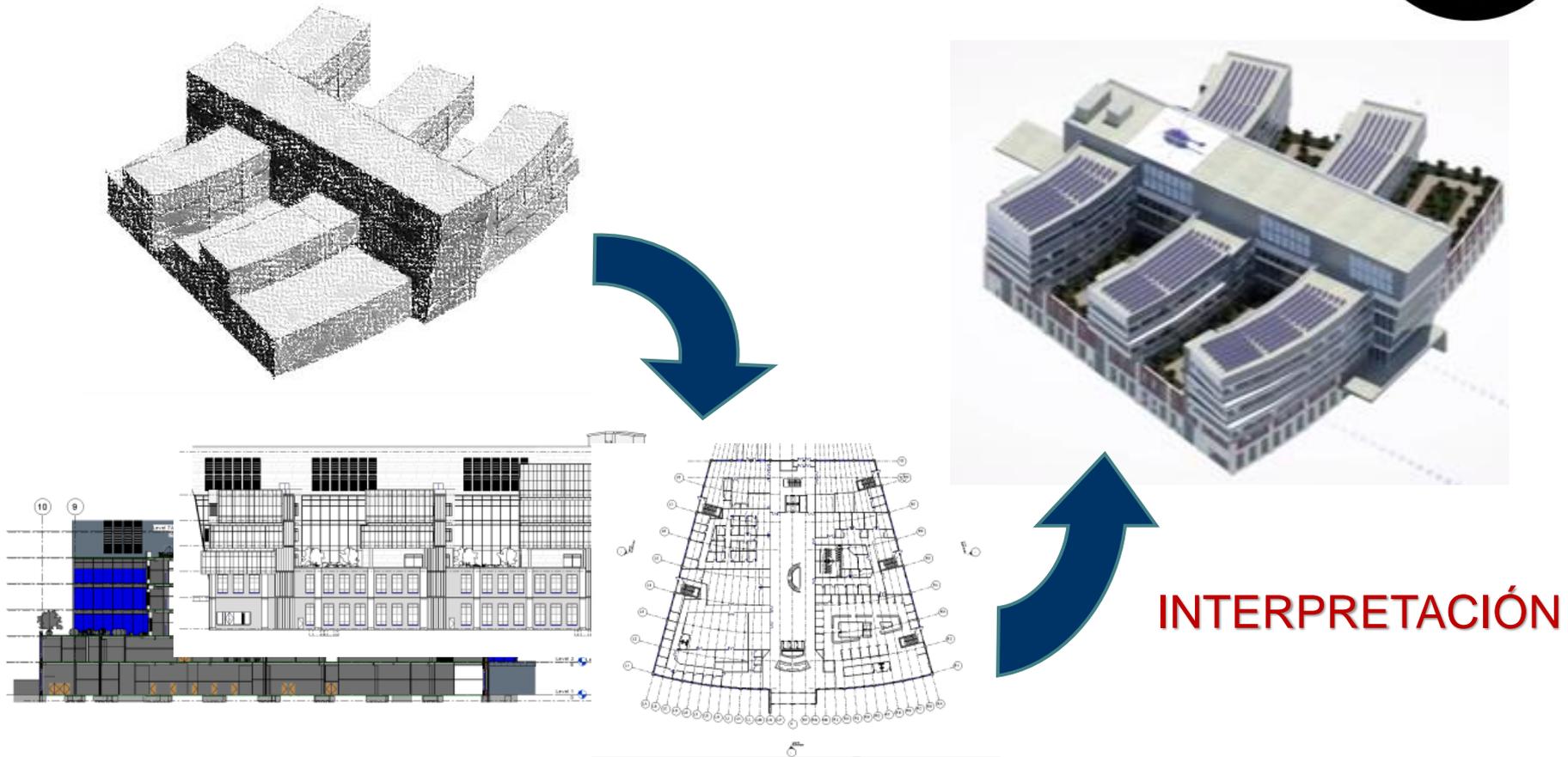
## BIM – Modelación Multidimensional Parametrizada



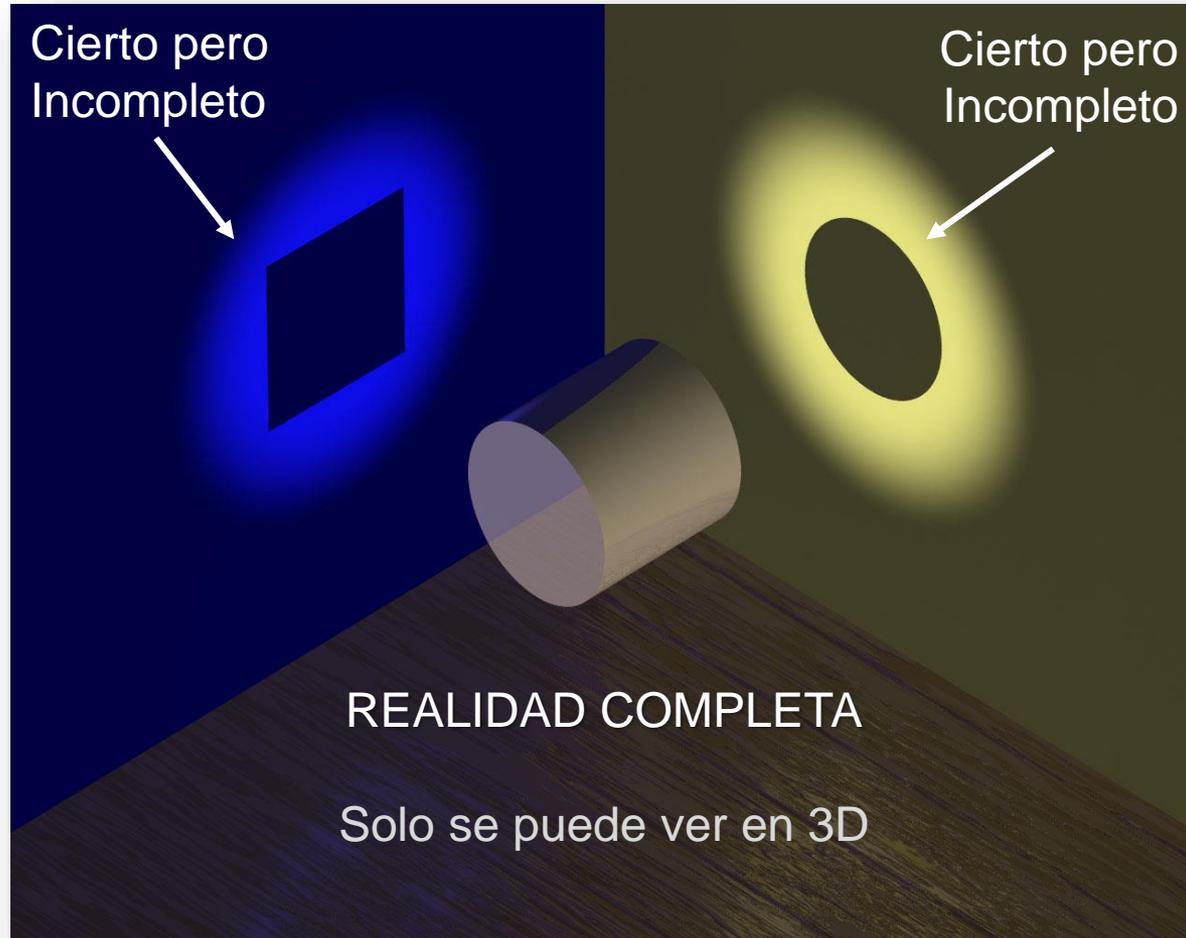
*“Si necesitas saber exactamente lo que vas a construir antes de empezar, seguramente nunca vas a comenzar”*

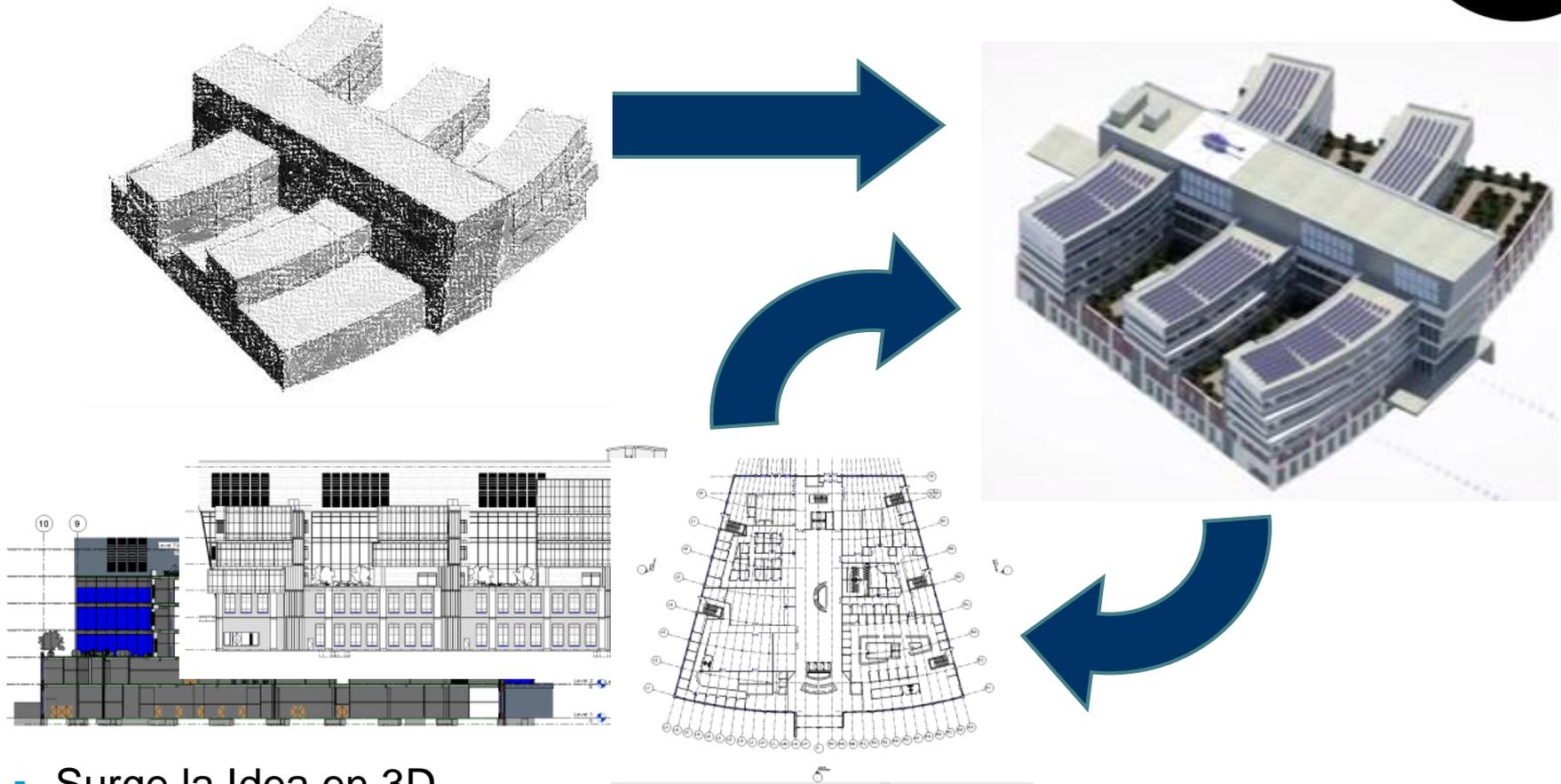
*– Frank Gehry*





- Surge la Idea en 3D
- Se generan los planos del proyecto en 2D
- Se crea un modelo 3D para generar visualizaciones
- Planos y modelo son independientes entre sí





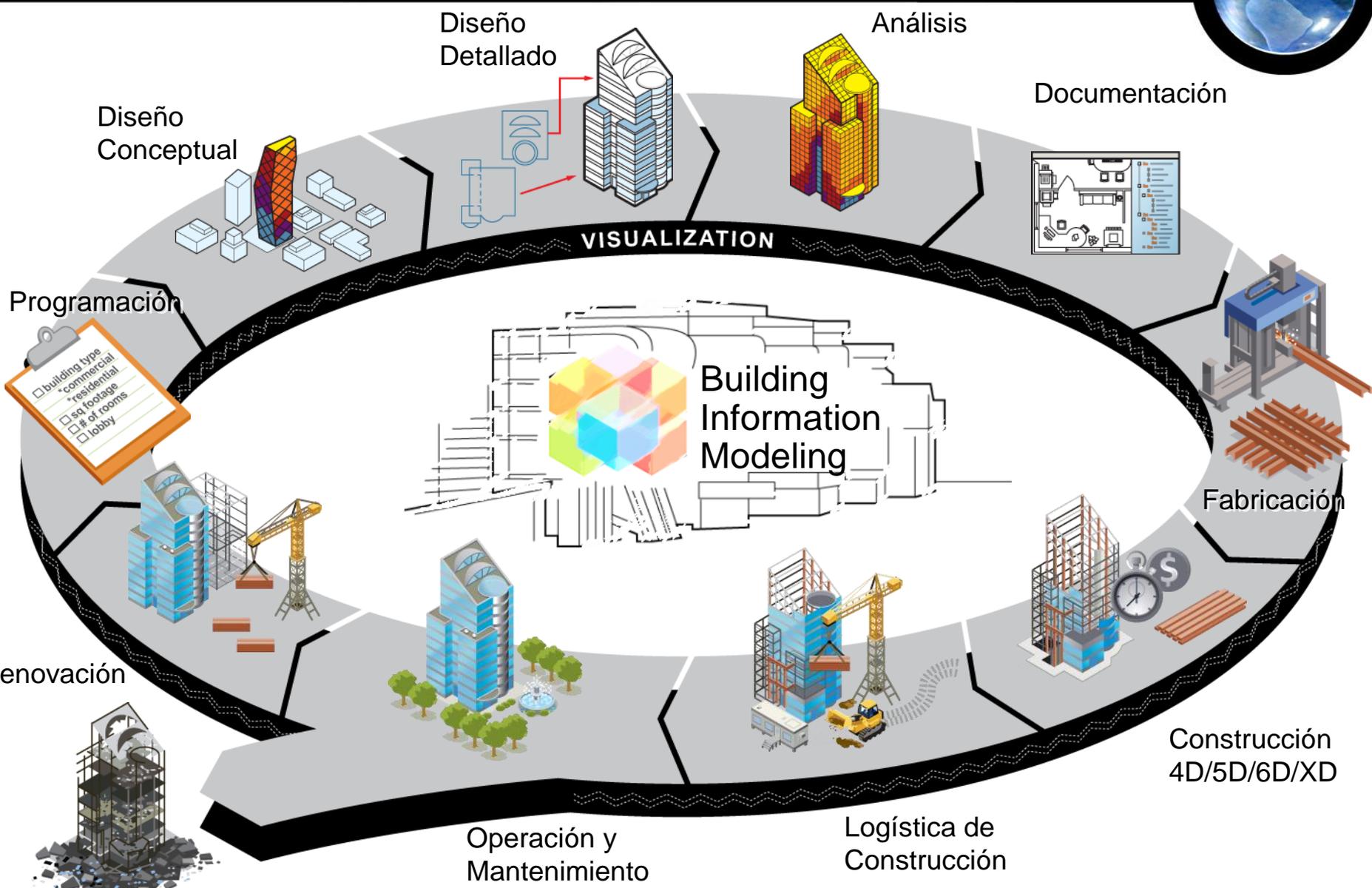
- Surge la Idea en 3D
- Se crea el proyecto del edificio en 3D
- Se obtienen los planos del proyecto en base al edificio
- Planos y proyecto están integrados de forma bidireccional



**Hysan Place**  
Basement Excavation

Modelación 4D en Infraestructura

# Ciclo de Vida BIM





BIM es una **Metodología de Trabajo por Procesos**  
no solo un **modelo REVIT**.



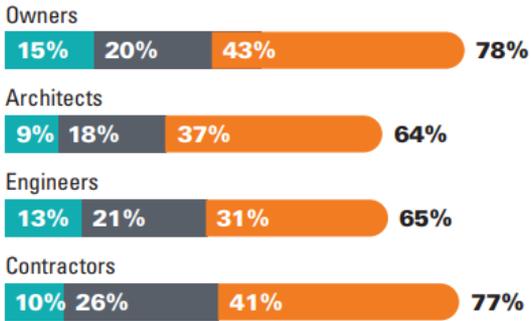
## BIM Impact on Schedule and Project Duration

(According to Owners, Architects, Engineers and Contractors)

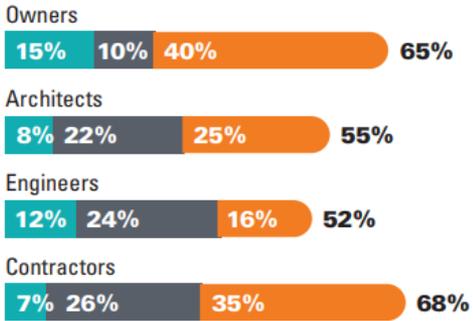
Dodge Data & Analytics, 2015

Very High High Medium

### Improved Achievement of Planned Schedule Milestone Dates



### Compressed Schedule Results in Accelerated Project Completion



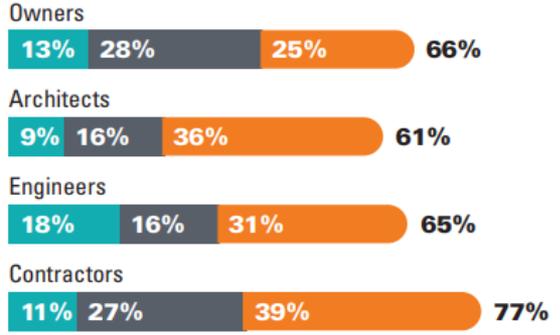
## BIM Impact on Cost Control and Reduction

(According to Owners, Architects, Engineers and Contractors)

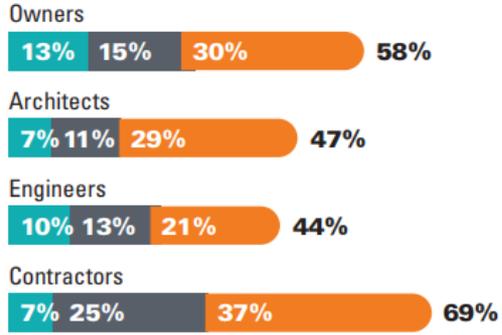
Dodge Data & Analytics, 2015

Very High High Medium

### Improved Process of Controlling Construction Costs



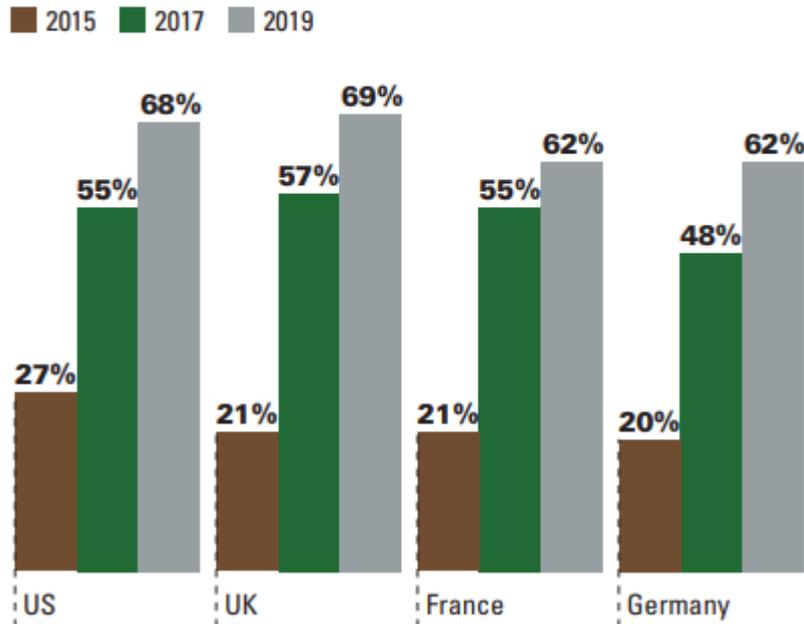
### Reduced Final Construction Cost of Projects





## Use of BIM on 50% or More Transportation Infrastructure Projects (According to Engineers and Contractors by Country)

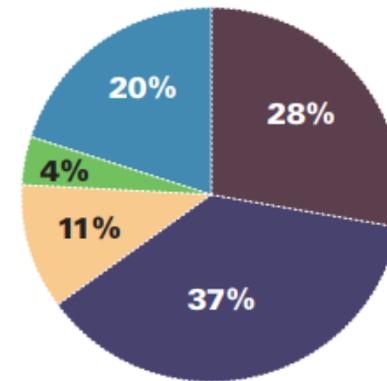
Dodge Data & Analytics, 2017



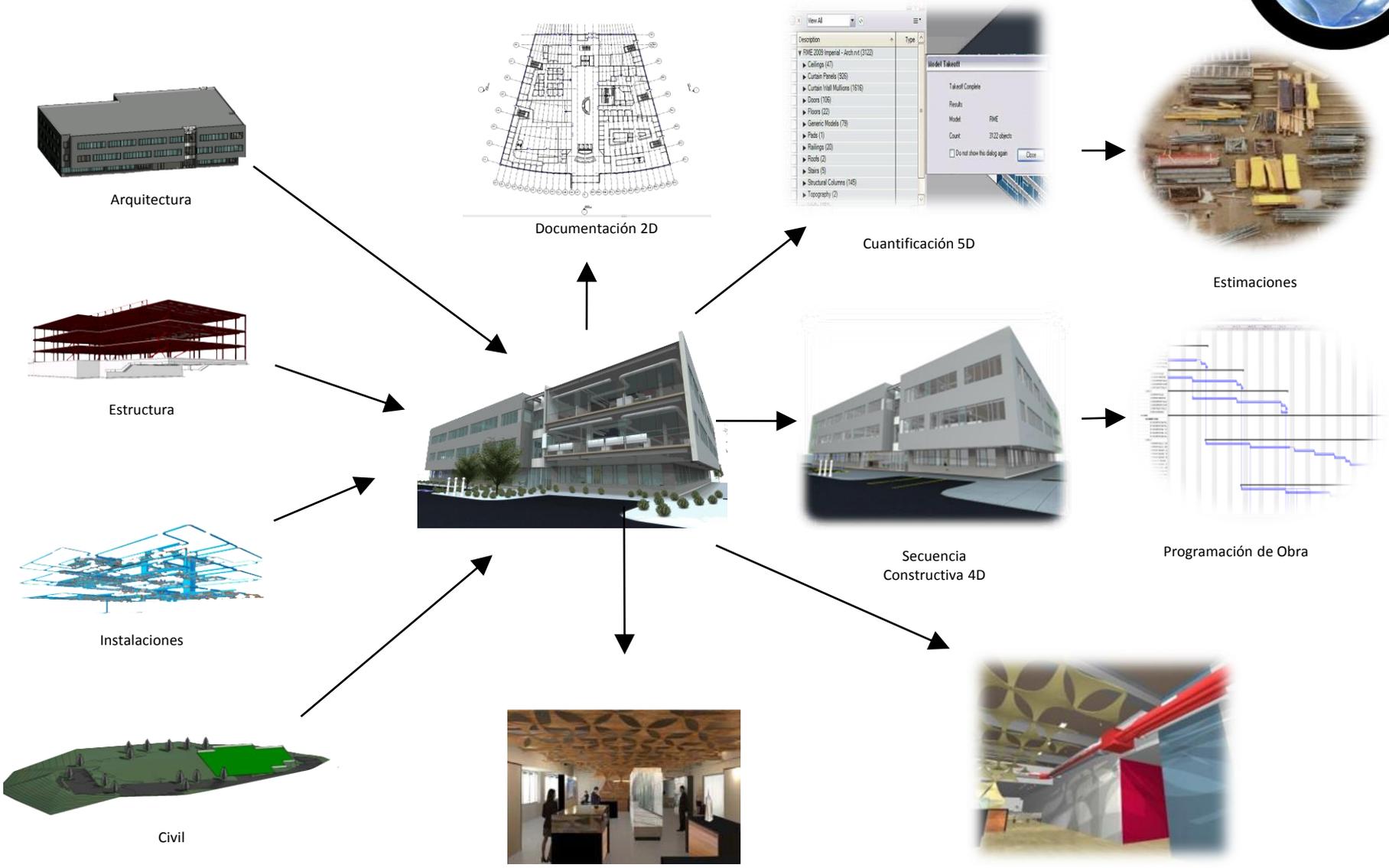
## Perceived ROI on BIM for Transportation Infrastructure (According to All BIM Users)

Dodge Data & Analytics, 2017

- Positive ROI of 25% or More
- Positive ROI Under 25%
- Break-Even
- Negative ROI
- Not Sure



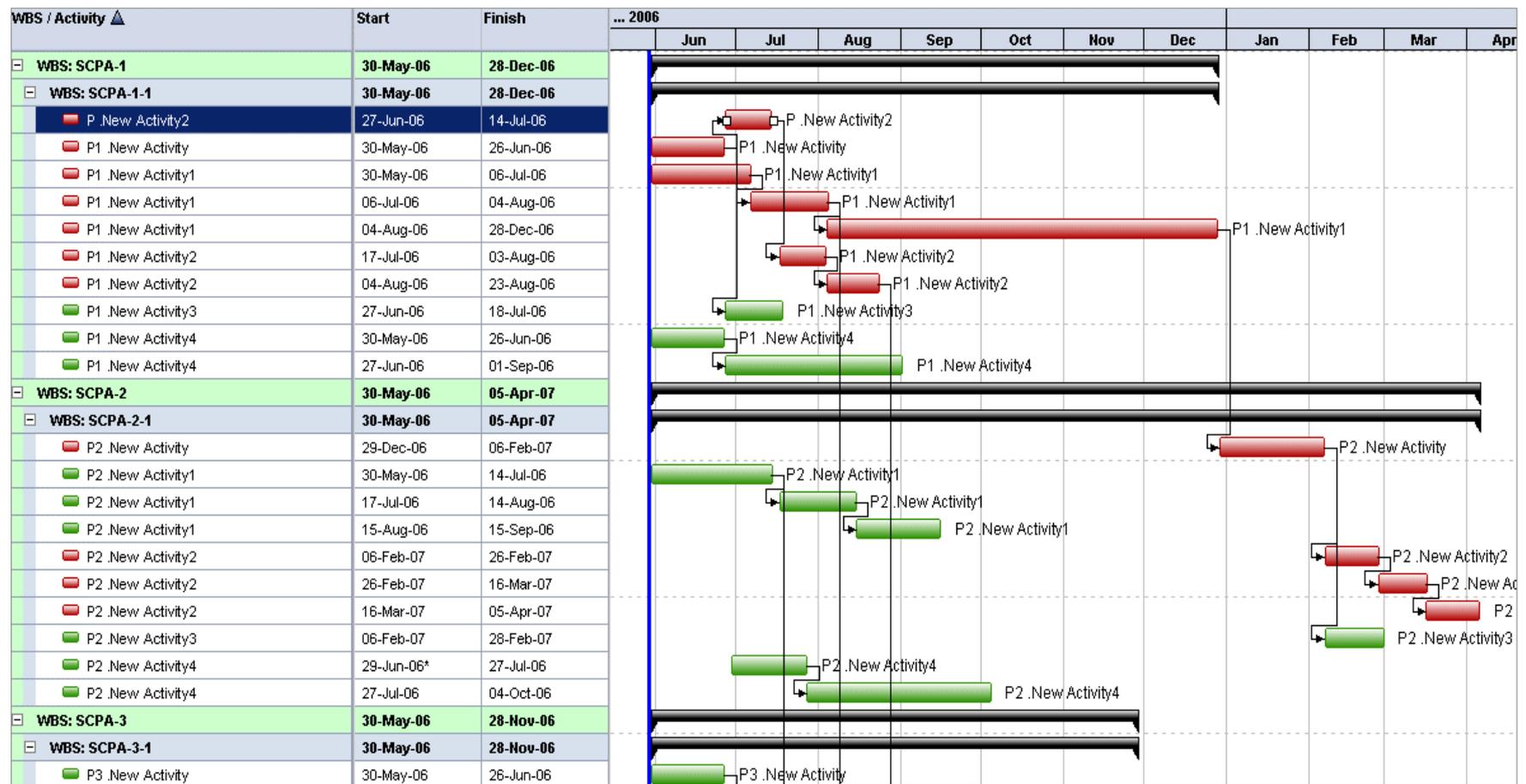
# BIM - Flujo de Trabajo



# CONTROLES DE PROYECTO

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 Ruta Critica (Multiples Proyectos)

# Mayor Control, Mejores Decisiones



**PRIMAVERA** Welcome, Bruce (V.P. of Construction)

Personal Workspace Related Actions Select an action...

**Schedule Performance**

Legend: Critical Warning Acceptable Exceptional

	To Date		Forecast at Completion	
	Schedule	Cost	Schedule	Cost
<b>Facilities Division Business Line</b>	★ 19 early	🟢 155,619 over	🟢 on schedule	🟢 533,939 over
9 Pacific Drive - Lofty Heights	★ 23 early	🟢 62,392 over	🟢 on schedule	🟢 34,339 under
Autumn Breezes Assisted Living Center	★ 12 early	🟢 53,896 over	🟢 on schedule	⚠️ 543,328 over
Lincoln Hospital Project Trauma Ward - April update	🟢 1 late	🟢 37,118 over	🟢 9 late	🟢 23,150 over
Office Building Addition	🟢 0 late	🔴 2,213 over	🟢 on schedule	🟢 1,800 over

Page: 1 of 1

**Resource Analysis Chart**

Allocation for All Resources Team by Project  
05-Mar-08 to 21-Dec-11

# Mayor Control, Mejores Decisiones



**PRIMAVERA** Welcome, Bruce (V.P. of Construction)

Personal Workspace Related Actions Select an action...

Autumn Breezes Assisted Living Center

Legend: Critical Warning Acceptable Exceptional

	To Date		Forecast at Completion	
	Schedule	Cost	Schedule	Cost
Autumn Breezes Assisted Living Center	★ 12 early	🟢 53,896 over	🟢 on schedule	🟢 543,328 over
Milestones		🟢 on budget	🟢 on schedule	on budget
Building 1	★ 16 early	🟢 53,725 over	⚠️ 12 late	⚠️ 512,100 over
Building 2	★ 16 early	🟢 10,952 over	🟢 3 late	🟢 11,056 over
Building 3	🟢 3 early	🟢 16,780 over	🟢 3 early	🟢 16,780 over
Building 4	🟢 on schedule	🟢 128 under	🟢 on schedule	🟢 128 under
Garage 1	🟢 2 early	🟢 3,520 over	🟢 2 late	🟢 3,520 over
Garage 2	🟢 on schedule	🟢 on budget	🟢 on schedule	🟢 on budget
Roads, Utilities & Pavers	★ 13 early	★ 30,952 under	🟢 on schedule	🟢 0 over
Landscape & Irrigation	No Progress	No Progress	No Progress	No Progress

Page: 1 of 1

# Mayor Control, Mejores Decisiones



**PRIMAVERA** Welcome, Bruce (V.P. of Construction)

Personal Workspace Related Actions Select an action...

**Building 1**

Legend: ✘ Critical ⚠ Warning ✔ Acceptable ★ Exceptional

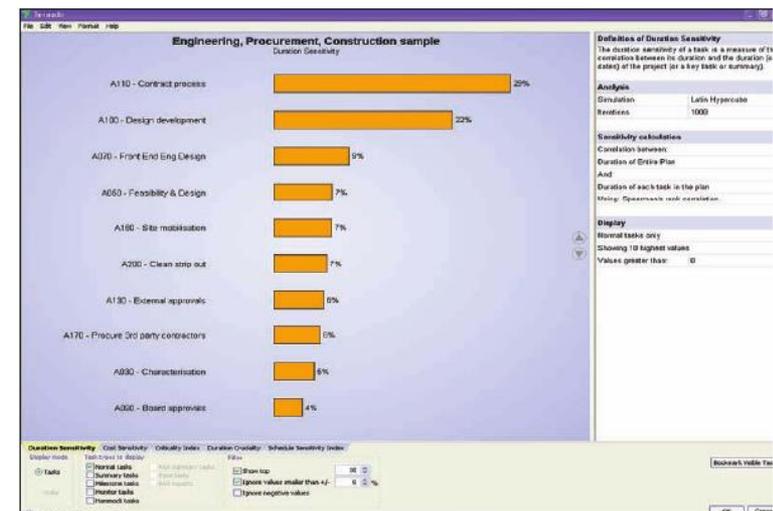
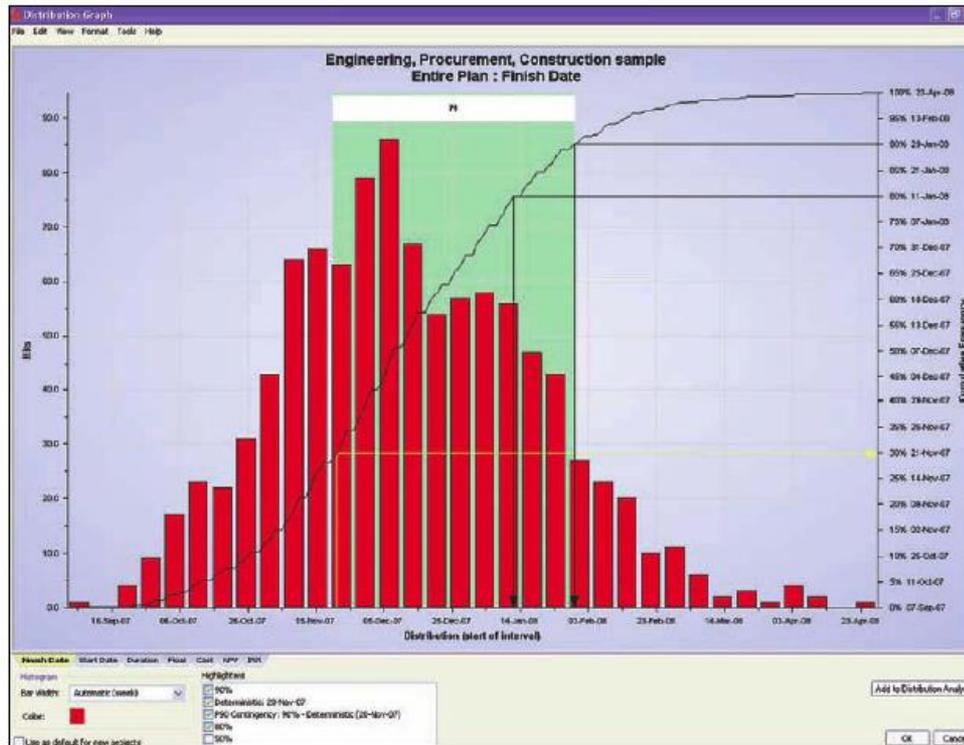
	To Date		Forecast at Completion	
	Schedule	Cost	Schedule	Cost
<b>Building 1</b>	★ 16 early	✔ 53,725 over	⚠ 12 late	⚠ 512,100 over
Structure	✔ on schedule	✔ on budget	✔ on schedule	✔ on budget
Roof	✔ on schedule	✔ on budget	✔ 5 late	✔ on budget
Envelope	✔ 5 early	✔ on budget	✔ 8 early	✔ on budget
Interior Finishes	★ 14 early	✔ 53,725 over	⚠ 12 late	✘ 512,100 over
Pool & Courtyard	No Progress	No Progress	No Progress	No Progress

Page: 1 of 1

	To Date		Forecast at Completion	
	Schedule	Cost	Schedule	Cost
<b>Building 1</b>	★ 16 early	✔ 53,725 over	⚠ 12 late	⚠ 512,100 over
Structure	✔ on schedule	✔ on budget	✔ on schedule	✔ on budget
Roof	✔ on schedule	✔ on budget	✔ 5 late	✔ on budget
Envelope	✔ 5 early	✔ on budget	✔ 8 early	✔ on budget
Interior Finishes	★ 14 early	✔ 53,725 over	⚠ 12 late	✘ 512,100 over
Pool & Courtyard	No Progress	No Progress	No Progress	No Progress



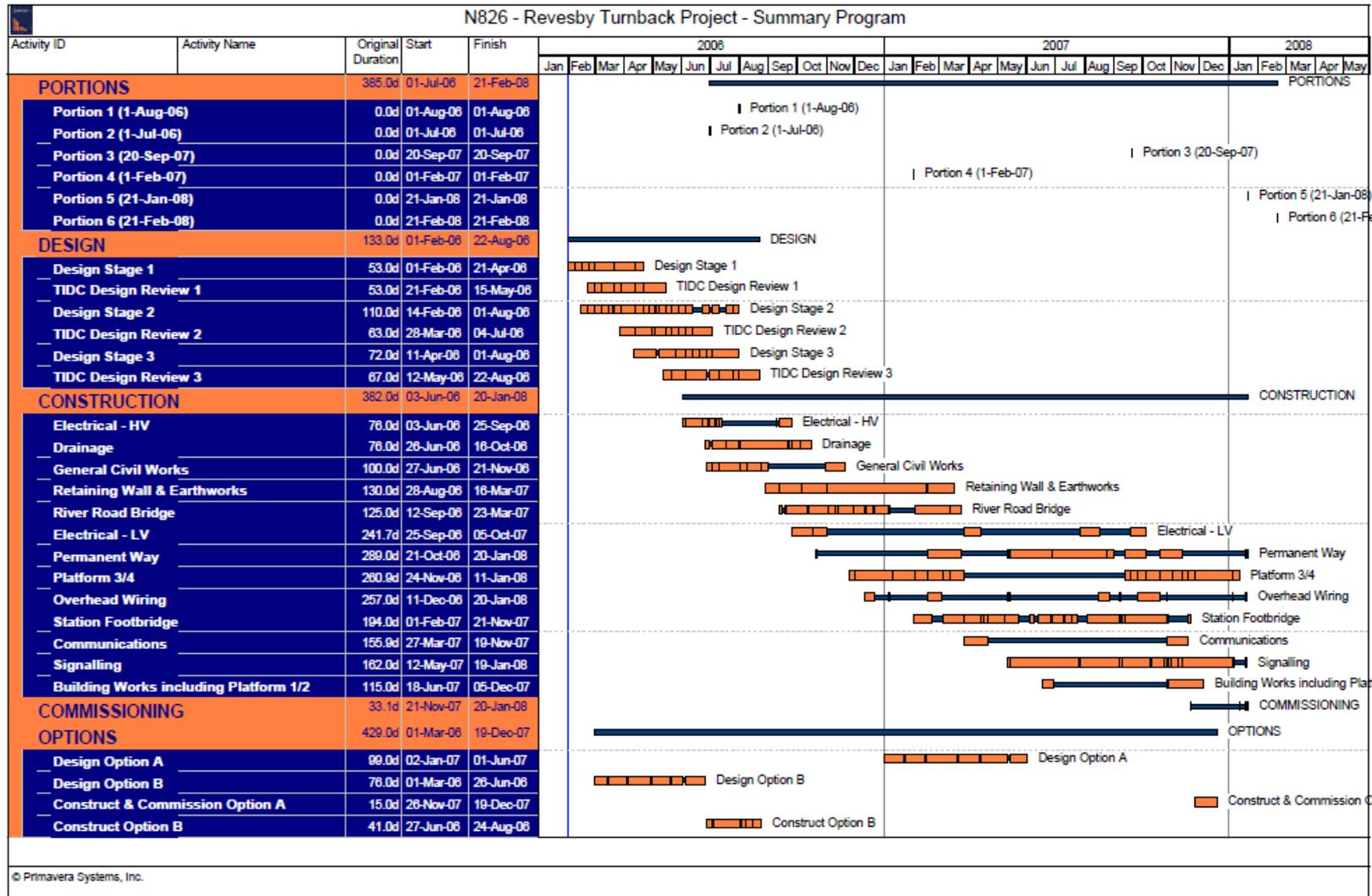
## Metodología Montecarlo





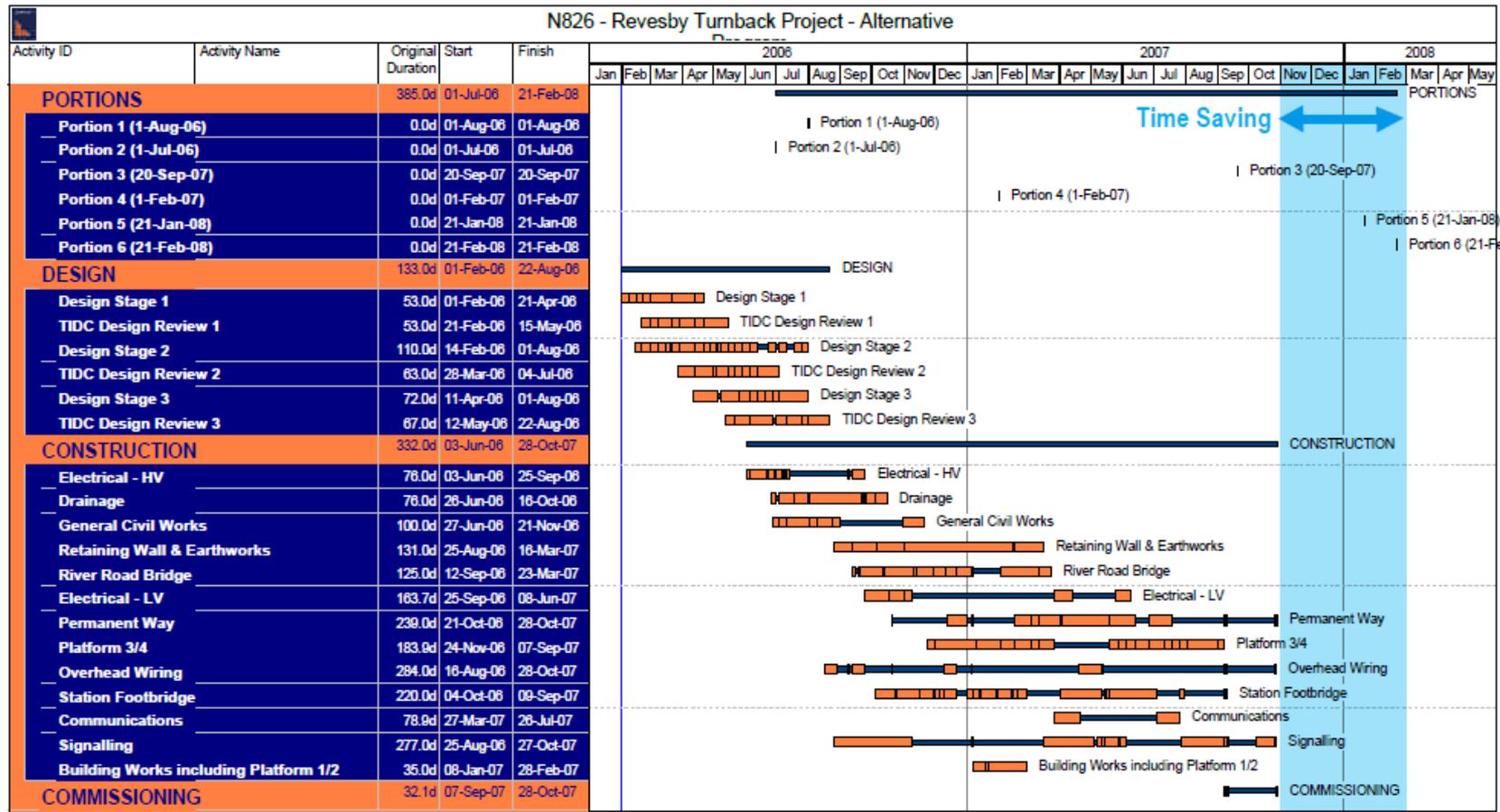
## REVESBY STATION – Sydney, Australia

## Programa de Licitación





## REVESBY STATION – Análisis de Alternativas



# RECLAMACIONES y Disputas

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**PREGUNTAS / comentarios ?  
(FAVOR usar el micrófono)**



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