

ARUP

# Improving Collaboration through Project Management

Delivering value through embedded collaboration practices

07 December 2022

The Big 5 International Building & Construction Show

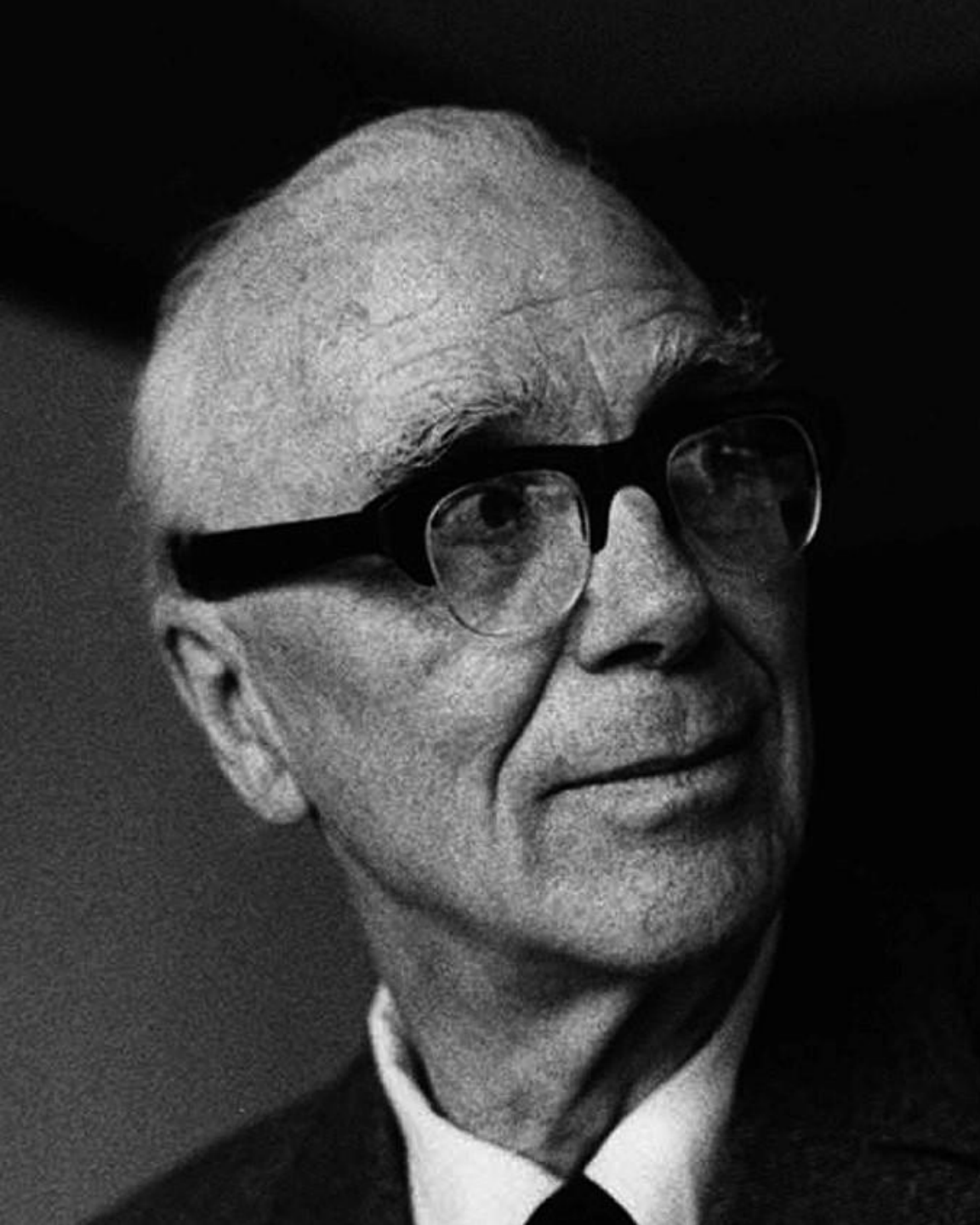
Paul Collins



# Agenda

- Demand & Delivery: the importance of working as a team
- How collaboration improves project delivery
- Effective communication & project organization
- Managing the impact of change

# Arup in the Middle East



*“It is not the wish to expand, but the quest for quality which has brought us to this position [Total Architecture], for we have realised that only intimate integration of the various parts or the various disciplines will produce the desired result.”*

*Sir Ove Arup, key speech*

# Global presence



**89** offices

**33** countries

**£1.8bn\*** turnover

**75 yrs** of profitable trading debt free

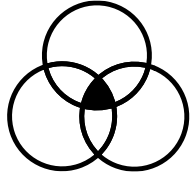
**17,000+** people

*as at Mar 2021 \*19/2020 financial year*

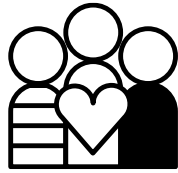
# Aims



Quality  
of work



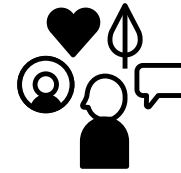
Total  
architecture



Humane  
organisation



Straight and  
honourable  
dealings































































Social  
usefulness



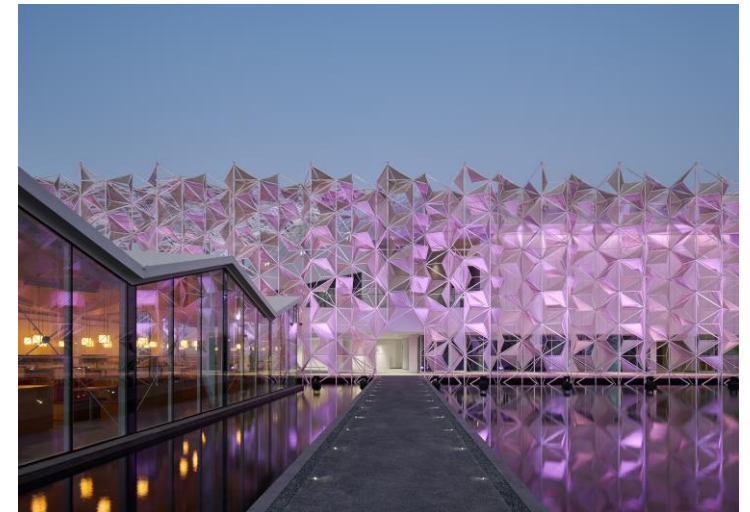
Reasonable  
prosperity

# Key Services

KEY SERVICES

 Accessibility	 Acoustics and Vibration	 Architecture	 BIM	 BMS and Design Controls	 Landscape Architecture	 LEED Consulting	 Life Safety Consulting	 Lighting	 Logistics and Transportation
 Building Condition Assessment	 Building Physics	 Business Continuity	 CDM Coordinator	 CFD	 Management Consulting	 Master Planning	 Materials Engineering	 Mechanical Engineering	 Operations and Maintenance
 Civil Engineering	 Construction Management	 Controls and Commissioning	 Controls and Security Engineering	 Cost Management	 Personnel	 Planning and Regulations	 Procurement Management	 Project Management	 Public Health Engineering
 Daylighting	 Digital Masterplanning	 Due Diligence	 Electrical Engineering	 Energy Consulting	 Reliability and Availability Engineering	 Security Risk and Resilience	 Seismic Engineering	 Site and Commissioning Support	 Site Inspections
 Environmental Engineering	 Façades	 Facilities Management	 Feasibility Studies	 Fire Safety	 SPOF Analysis	 Structural Engineering	 Structured Cabling System	 Sustainability	 Systems Architecture
 Fluid Dynamics	 Geology and Geotechnics	 ICT Networks	 Interior Design	 IT and Communications	 Technical Due Diligence	 Telecommunication Engineering	 Testing and commissioning	 Threat and Risk Assessment	 Vibration

# Arup Gulf Limited

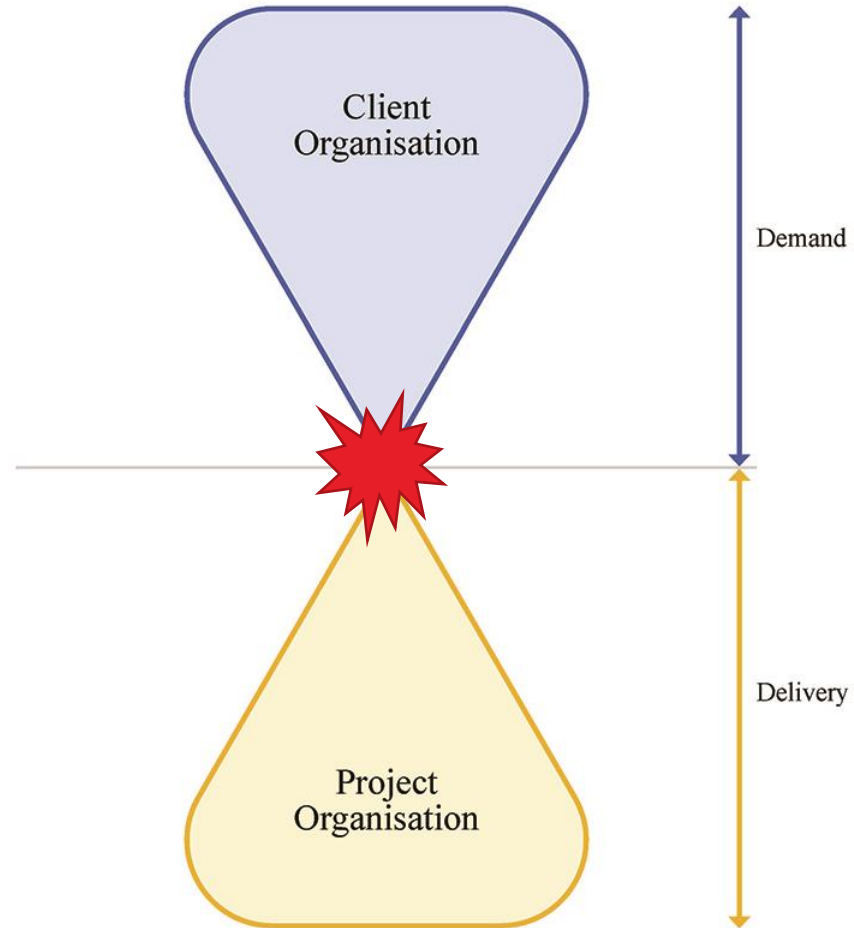




# Demand & Delivery

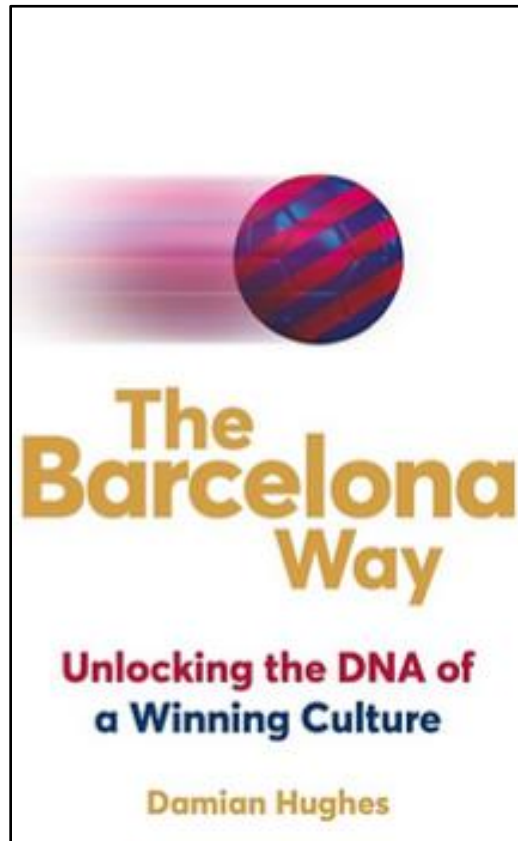
The importance of working as a Team

# Demand & Delivery



- Client
- Design Team
- Stakeholders
  
- Contractor
- Sub-contractors
- Suppliers

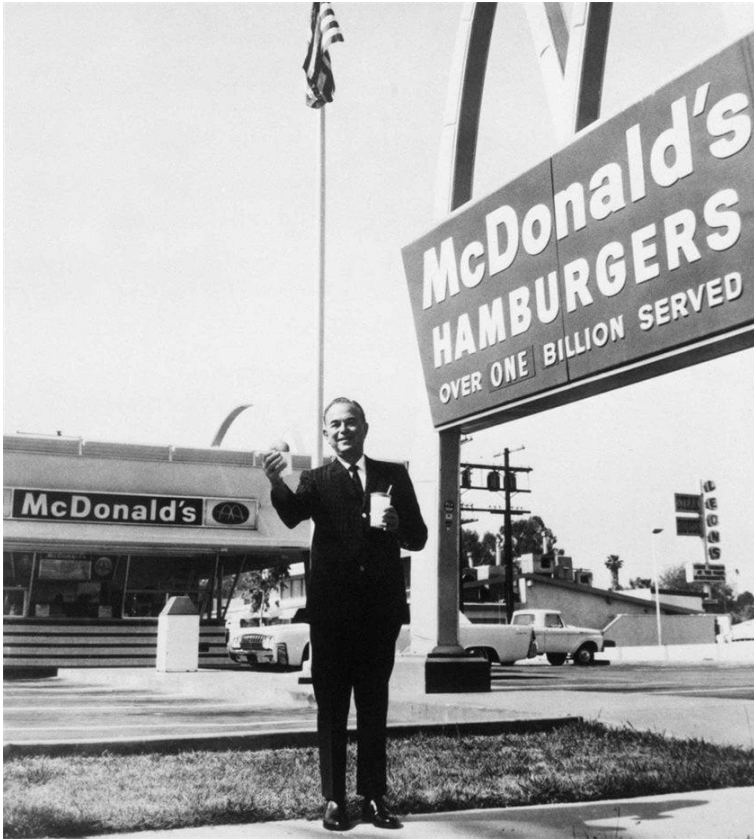
# The Barcelona Way



*‘For anything to change,  
someone has to start  
acting differently’*

- The key to culture change is *behaviour change*. If people don't start acting differently the culture will not change.
- To change behaviour, *change the environment*. Focus on creating feedback loops from the environment that reinforce desired behaviours

# Lead from the Top



*‘The more I help others  
to succeed, the more I  
succeed’*

- The 3-legged stool approach:
  - Happy employees
  - Happy suppliers
  - Happy franchisees

# Collaboration

How a collaborative approach improves projects

# Our collaboration model

## A framework for building collaborative behaviours

Arup’s collaboration model has been developed as a result of extensive research with internal project experts, skilled occupational psychology practitioners and clients. It is a tried and tested approach, based on psychological research findings which clearly outlines the required behaviours relevant to improving collaborative working and increasing efficiencies at a team, project and even organisational level. **Arup’s Framework for collaborative behaviours:**

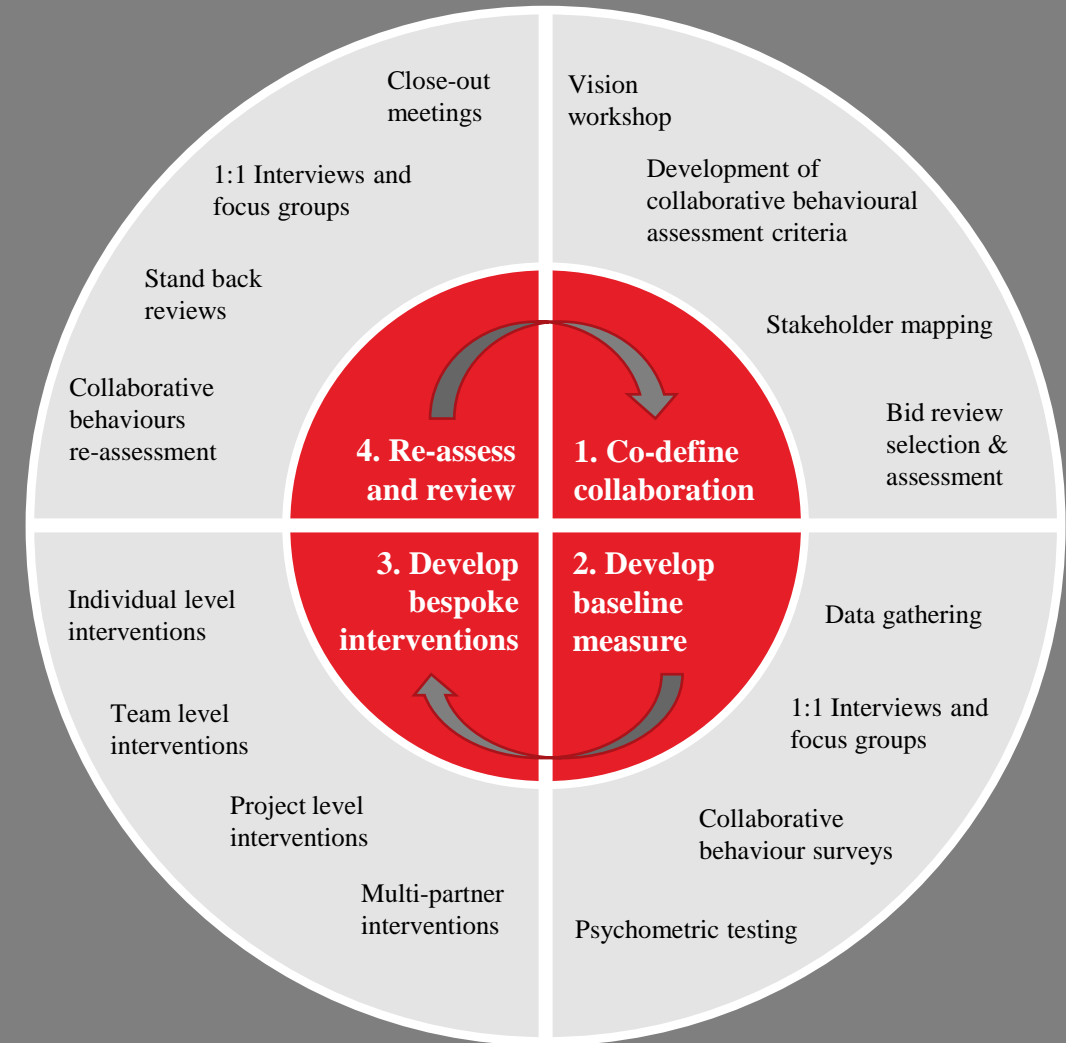


# Our approach

## A bespoke process for continual improvement

We employ a participatory approach in co-defining collaboration with clients and project teams, backed with psychological principles and continuous improvement plans to facilitating teams in achieving collaborative working. **Arup's process:**

- A cyclical approach to continual improvement across collaborative behaviours, begins with a tailored definition that is specific to the context and team.
- Quantifiable baseline measures are developed out of this definition which are used to benchmark performance and clearly define the success metrics.
- Development activities draw upon sound psychological knowledge and domain specific insights, through a multi-level approach.
- Progress review and data collation complete the cycle and focus attention so that additional development can employed as required.



# Collaboration standards

Alignment to ISO 44001 (previously BS11000)

Arup tools mapped against ISO 44001

Arup's accreditation to ISO 44001





# Smart Motorways Programme, National Highways

## The challenge

The AS14 Scheme comprised of **five schemes delivered between three suppliers**, Mouchel, WSP/PB and Amey Arup, requiring a **consolidated approach to delivery** underpinned by cross-fertilisation of understanding, lessons learnt and ideas to drive **consistency, efficiencies and best practice**.

## Arup's Approach

The Smart Motorways methodology combined development activities across the following areas:

- **Selection and Induction:** psychometric testing for selection, programme induction, including behavioural contracting
- **Development:** Team and personal development plans, targeted training and leadership coaching
- **Collaboration Engagement:** Communication planning and implementation, team events and forums, team charter and toolkit
- **Assess and Review:** Quarterly behavioural assessments, 1:1 feedback and surveys

## Outcomes and Value

The Joint Venture fostered a **shared culture** where everyone was known as **AmeyArup**, creating a **positive team spirit** and a shared sense that development and team performance are truly valued. This enhanced **collaborative working, communications and relationships across organisational boundaries**, within a combined team comprising of client, suppliers and sub-consultants, which has delivered **performance, efficiency and quality benefits**.



# Communication

Effective communication & Project Organisation

# Define Responsibilities

## The RACI Process Provides a Clear Basis for Defining Changes to Accountabilities and Structure

### Definition

- R** **Who is RESPONSIBLE?** The person who has to do it (the doer)
- A** **Who is ACCOUNTABLE?** The person who makes the final decision and has ultimate ownership
- C** **Who is CONSULTED?** The person who must be consulted *before* a decision or action is taken
- I** **Who is INFORMED?** The person who must be informed that a decision or action has been taken

#### Sample RACI Matrix:

PROCESS: Making a process change

Activities	Functional Roles			
	Process Facilitator	Line Facilitator	Setter	Operator
Plan activities	I	A	A	I
Prepare detail		C	A/R	I
Change process document	A	R		I
Perform change	I	A	R	R

### Use

- **Project Management**—to assign responsibilities and ensure tasks get done
- **“As Is” Analysis**—to diagnose problems in the organisation
- **“To Be” Design**—to create a new organisation structure that meets the needs of the “To Be” design

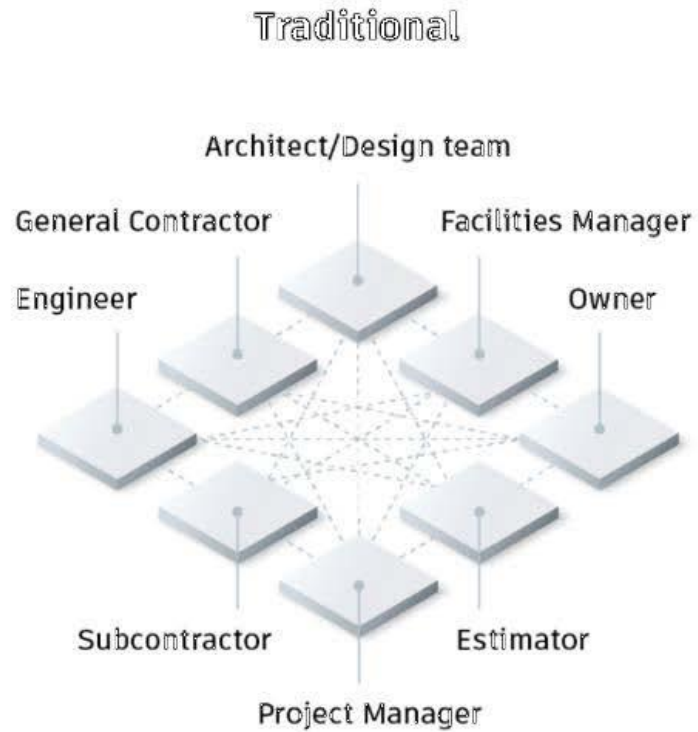
#### RACI Analysis:

	<i>If you find:</i>	<i>If you find:</i>
Horizontal	<b>Lots of Rs</b>	Too many people involved?
	<b>No Rs or As</b>	Why do it? Is the job getting done?
	<b>More than one A</b>	Confusion, indecision? Does everyone consulted add value?
	<b>Lots of Cs</b>	Do they all need to know?
Vertical	<b>Lots of Is</b>	
	<b>Lots of Rs</b>	Too much work?
	<b>No empty space</b>	Too much work? Too much consultation?
	<b>No Rs or As</b>	Can the function be eliminated?
	<b>Too many As</b>	Is accountability at the right level? Is the organisation too hierarchical?

# Example Responsibility Matrix

Activity	Project Sponsor	Develop. Manager	Represent. User	Project Leader	Project Manager/ Cost Manager	Lead Consultant	Main Contractor
<b>RISK &amp; OPPORTUNITY MANAGEMENT</b>							
Initiate and maintain Risk Register	I	C	C	A	R	C	C
Coordinate risk reviews and risk assessment	I	C/I	C	A	R	C	C
<b>CHANGE CONTROL</b>							
Management of change	I	I	C	A	R	C	C
Use of Project Contingency	I	I	C	A,R	C	I	I
<b>PROCUREMENT &amp; CONTRACTS</b>							
Design team appointment and fees	I	I	I	A	R	C	-
Outline Procurement Strategy (Construction)	I	C	I	A	R	C	-
Detailed Procurement and Contract Delivery Plan (Construction)	I	I	I	A	R	C	-

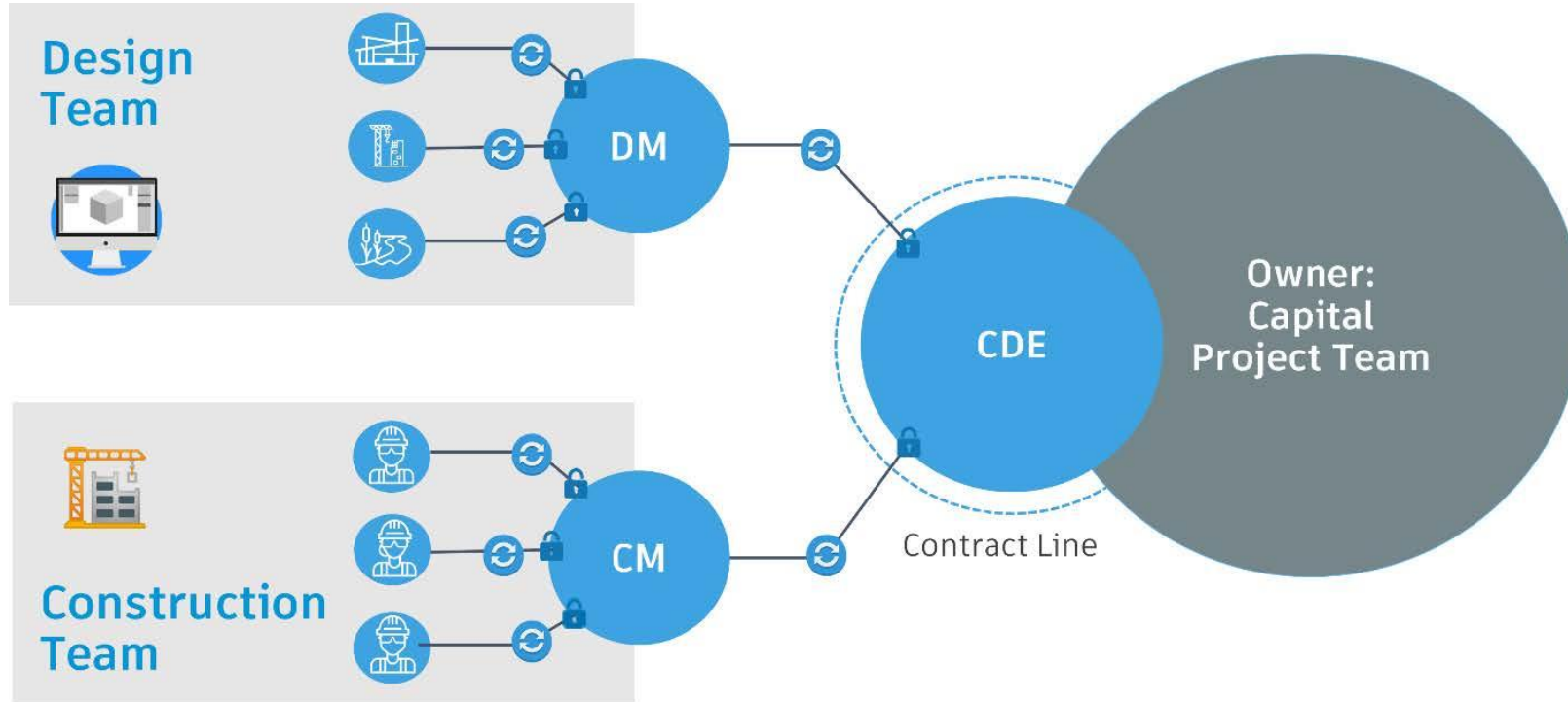
# Digital Tools



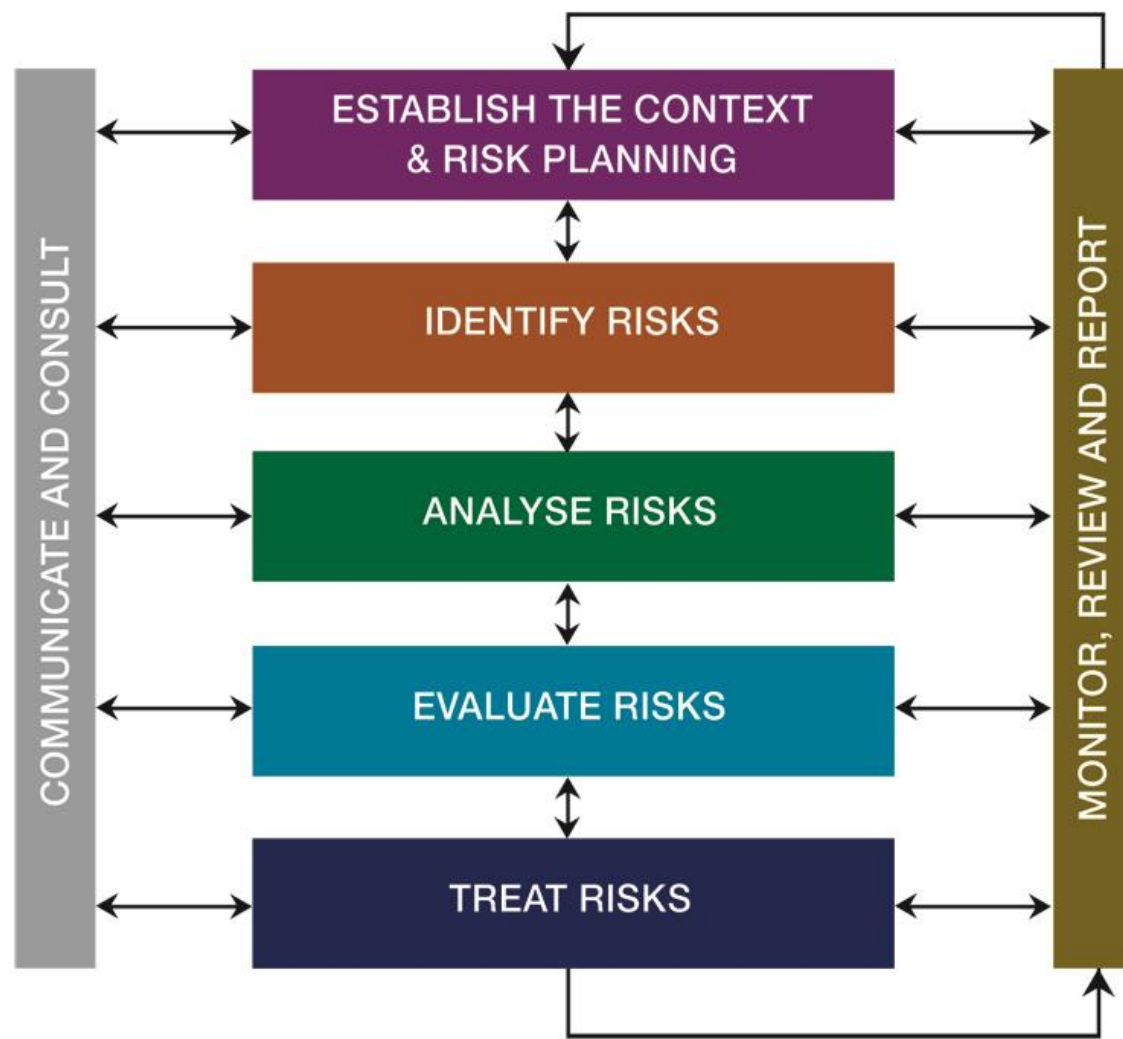
## Common Data Environment (CDE)



# Digital Tools



# Our Risk Management Process



# Change Management

Improving project performance & reducing risk



# Development of a Project



Original  
Contract



Final  
Situation

# Most Common Types of Change

1. Scope Expansion / New Disciplines	4. Contractor Construction Error	7. Temporary Works	10 Redesign due to late information
2. Value Engineering	5. Client change on design	8. Acceleration	
3. Prolongation	6. Changes in law or regulations which lead to rework	9. Unexpected Site Conditions	

I HAVE NO IDEA  
WHAT'S GOING  
TO HAPPEN.



AND I LOVE IT.

# The Impact of Change



## Organisation

- How does change impact people across the WHOLE?
- How do we make this work for ALL?
- At an organisational level negative experiences can lead to lower performance.

## Team

- How does each person react? (Fear, Acceptance, Anger, Resistance)
- What can I do to help them COPE and get their BUY-IN?
- All changes have the potential to negatively impact those involved.

## Individual

- How do I personally react and show up?
- Can I cope with the change?
- What do I need to help me to cope better?
- At a personal level this means fear, conflict between old and new ways of working, resistance to changes being made.

# Communication & Transparency

## Embrace change

- it will happen
- it is constant

Add Change Log  
Review to your  
weekly meetings  
Agenda:

- Update of the  
current change log
- Alert of potential  
change request  
down the line

Be fair and  
honourable in our  
dealings:

Be clear on:

- what is change
- what is design  
development
- what's included in  
the scope

Communicate to all  
members of the  
project team-

Remember - change  
impacts everyone

Spend time  
developing Team  
Relations which are  
built on trust

# Formalising Change Tracker/Log

West		Master				ARUP			
Change Log		ISSUE DATE: 04-Nov-16							
		Reviewed and re-issued 18-May-17							
DCN	Change ID	Description	Source	Requested by	Date	Disciplines to Action	Comment	Total Cost	Classification
	108	Changing toilets layout internally in building - Redesign of foul drainage			Civil ongoing since rev. C3 17/09/15 to C4 2/11/15	C	21.07.16 (Civil) revised design of foul network and Drwg C-020 were revised to include new outlets from toilets within building. Liasing with Architect on toilet layouts was also carried out. (2016-08-02 JMcC) Following redesign of locker area (Change 29) toilets had to be relocated resulting in design coordination and revised		
	30	Lift 3 configuration to be updated to optimise access to the lab for materials delivery. Include a coat room at L3 in the layout.	West	BG	13-Jul-15	A, S, E	Revised design to facilitate lab layout. (JMC Arch 29.07.16) change to dumb waiter lift on GF level resulted in changes in L3, numerous options and layouts produced. (JT Elec 4.8.16) Goods lift serving canteen and lab was relocated for better access. Resulted in a through car to a simple car, Special controls to facilitate the transport of Nitrogen had to be incorporated.	4,039.56	CSA
	31	Process drain to be changed to stainless steel to cater or higher temperatures of the waste flows than previously advised.	West	AV	16-Jul-15	C, M	Discharge temperatures advised post construction design 21.07.16 (Civil) spec for pipe revised, underslab drainage drawing C-071 & C-072 revised, investigations in pipe spec and pipe insulation for stainless steel pipe including cross sectional detail.	1,717.57	Utilities
	32	Purified Water removed from Clean Media scope. Clean media to consist only of WFI and Clean steam. The WFI is to be generated by vapour compression distillation unit	West	AV	29-Jul-15	ME	Reduced equipment cost - Arup MEP prepared clean media assimilator to support this decision. (27.07.16 JP/KOH) assessment required by WEST to change to WFI only.	3,192.80	Cleanmedia
	33	Additional Process Cooling Water Connection Points	ICP Workshops	West	25-Mar-15/ 02-Jul-15	M	Cost of additional points. (27.07.16 JP/KOH) rebriefing the works at DD stage. This information should have been on the basic design equipment list.	1,102.56	Utilities
	34	Additional Compressed Air Connection Points	ICP Workshops	West	25-Mar-15/ 02-Jul-15	M	Cost of additional points. (27.07.16 JP/KOH) rebriefing the works at DD stage. This information should have been on the basic design equipment list.	1,102.56	Utilities
	35	Number of fume hoods in laboratory increased	Lab design development	West	16-Jun-15	M, A	Lab design and cost of additional fumehood	-	
	36	Helium / Hydrogen / Argon-Methane / Argon / Oxygen	Lab equipment list	West	19-Jun-15	M	Additional design and gas piping with larger gas bottle store	-	
	37	2 No. New Laminar Flow Hoods in Finishing	Finishing Workshop	West	02-Jul-15 25-Mar-15	M, A	Additional scope. (27.07.16 JP/KOH) prepare drwgs, specs and data sheets. (JMC Arch 29.07.16) update drwgs to incorporate changes, ongoing up to date. (JT Elec 4.8.16) Updated electrical layouts and additional small power requirements.	1,949.52	HVAC

# Critical success factors of change

## Visionary

A rational driving force behind the venture, simply expressed, clear and transparent in order to foster critical internal and external support

## Leadership

Making this the top business priority, with clear leadership, ensuring that it is tightly managed and well resourced

## Open

An open culture that does not bury bad news but deals with issues constructively and pragmatically



## Considerate

Sensitive handling of HR issues during a period of considerable change and uncertainty

## Supportive

Process of performance measurement and management over the transition with incentives

## Agile

A well structured but flexible plan with some allowance for contingency – a core competence of the change management team should be methodical and able to deal with ambiguity

# If we get it right....

ARUP



ARUP