Predictive Cost Control & Commercial Intelligence

How project data, AI and forecasting can be embedded into commercial controls — without undermining accountability.

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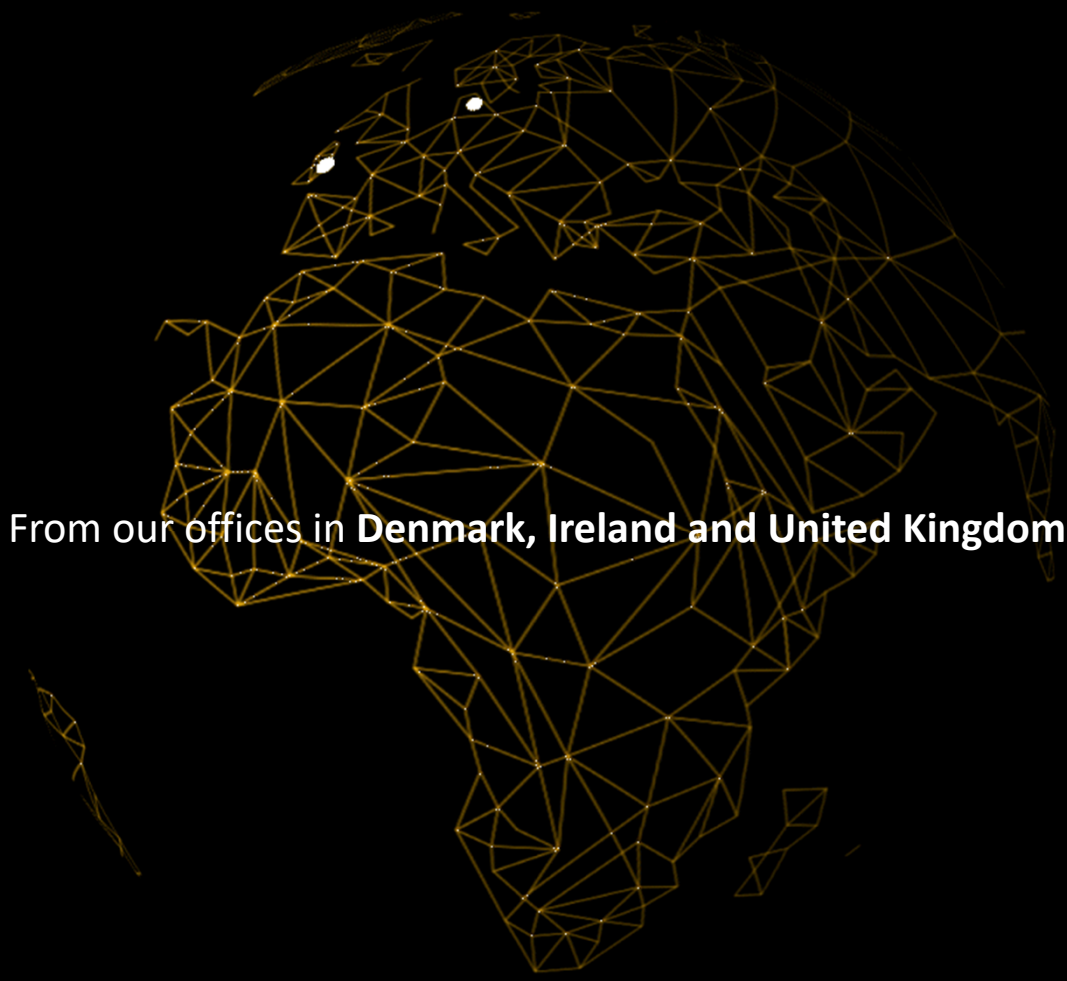

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Today's Session

01

The Problem With Backward-Looking Controls

Why lagging indicators leave teams exposed

You're Managing Yesterday's Project

Traditional Approach

- Valuations issued monthly — data already 4–6 weeks old
- Cost reports reflect completed work, not emerging trends
- Variations captured after the fact
- Cashflow forecasts based on programme assumptions, not actuals
- Risk flagged when it's already crystallised

Predictive Approach

- Live progress data feeds rolling cost-to-complete models
- Constraint logs and productivity rates signal slippage early
- Change control pipeline visible before formal instruction
- Cashflow projection refreshed from real procurement signals
- Risk surfaced while there is still time to act

The gap between what you report and what is actually happening is where commercial exposure lives.

02

What Predictive Analytics Actually Means

In the commercial and construction context

Four Levels of Analytics Maturity

01

Descriptive

What happened?

Cost reports, valuations, final accounts. The standard QS output.

02

Diagnostic

Why did it happen?

Variance analysis, trend investigation, root cause of overruns.

03

Predictive

What will happen?

Forecasting delay risk, cost-to-complete, cashflow outturn — before it happens.

04

Prescriptive

What should we do?

Scenario modelling, recommended actions, optimised submissions.

Most commercial teams operate at levels 1–2. The opportunity is levels 3 and 4

0 3

The Inputs That Matter

What data actually drives a useful forecast

Signal vs. Noise — The Right Inputs

Programme & Progress

- → % complete vs planned
- → Earned value metrics
- → Lookahead programme data

Productivity & Labour

- → Output rates vs benchmarks
- → Constraint logs & delays
- → Gang sizes & shift patterns

Commercial Pipeline

- → Uncommitted cost exposure
- → Change control register
- → Procurement status & prices

External Signals

- → Material price indices
- → Weather & site conditions
- → Subcontractor solvency flags

Not all data is equal. Inputs must be timely, consistent and traceable to be forecast-ready.

Data Readiness — The Honest Assessment

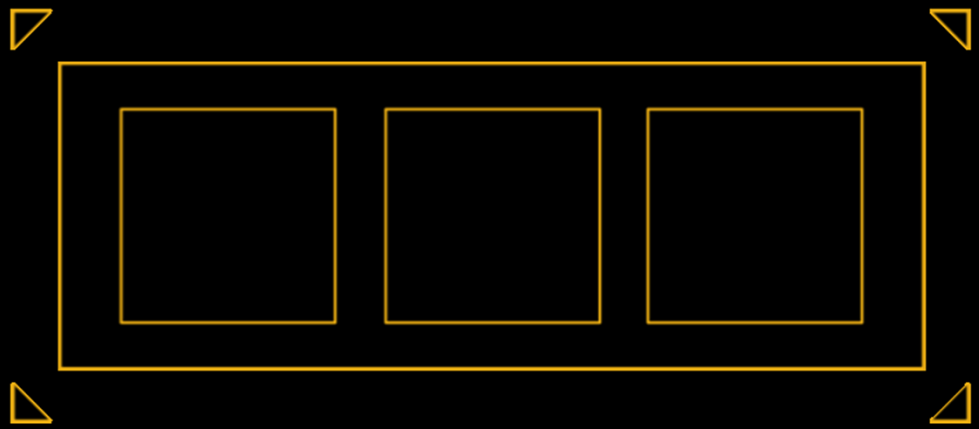
Data Type	Availability	Quality Challenge	Forecast Usability
Programme (P6/Asta)	Usually exists	Often not updated	**Medium**
Progress %	Sometimes	Subjective	**Low–Med**
Cost commitments	Yes	Good in ERP	**High**
Change register	Inconsistent	Manual, patchy	**Low**
Labour outputs	Rarely captured	Not tracked	**Low**
Procurement signals	Sometimes	In buyer's head	**Low**
External indices	Yes (BCIS/ONS)	Good	**High**

Improving data quality is the highest-leverage investment before deploying predictive models.

04

Models, Forecasts & Scenario Testing

Translating data into commercial foresight



Practical Model Types for Construction

Cost-to-Complete Forecasting

Blends committed costs, productivity rates, and earned value to project outturn cost. Updated from live data rather than static assumptions.

For: QS / Cost Manager

Delay Risk Modelling

Monte Carlo or regression models applied to constraint logs, weather, lookahead programme and historical slippage patterns to forecast completion probability.

For: Project / Programme Manager

Cashflow Projection

Refreshed from procurement commitments and progress actuals. Flags negative cashflow windows and mismatches against application cycles.

For: QS / Commercial Director

Change Control Pipeline

Tracks identified, potential, and instructed variations. Flags commercial exposure and likelihood of entitlement to support stronger submissions.

For: QS / Contract Manager

Subcontractor Risk Scoring

Combines financial signals, performance data and procurement status to flag at-risk supply chain before problems escalate.

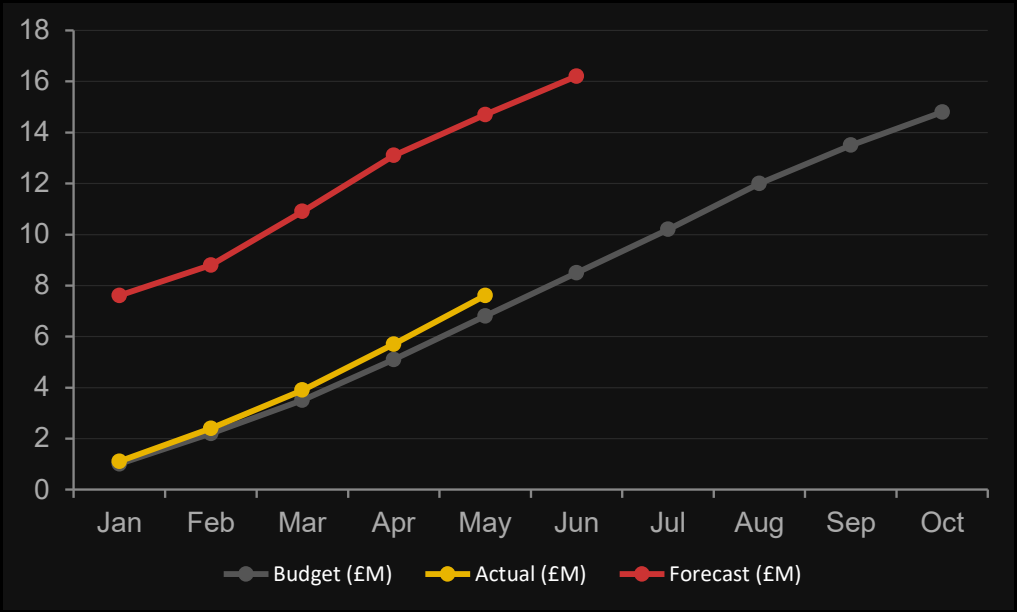
For: Commercial / PM

Scenario & Sensitivity Testing

Allows teams to stress-test 'what if' scenarios — delay, inflation, scope growth — to understand commercial impact before it occurs.

For: All Roles

Cost-to-Complete: What the Model Shows



Budget at Completion

£14.8M

Original contract

Forecast Outturn

£16.2M

+£1.4M exposure

Overrun Signal

Month 2

When model flagged risk

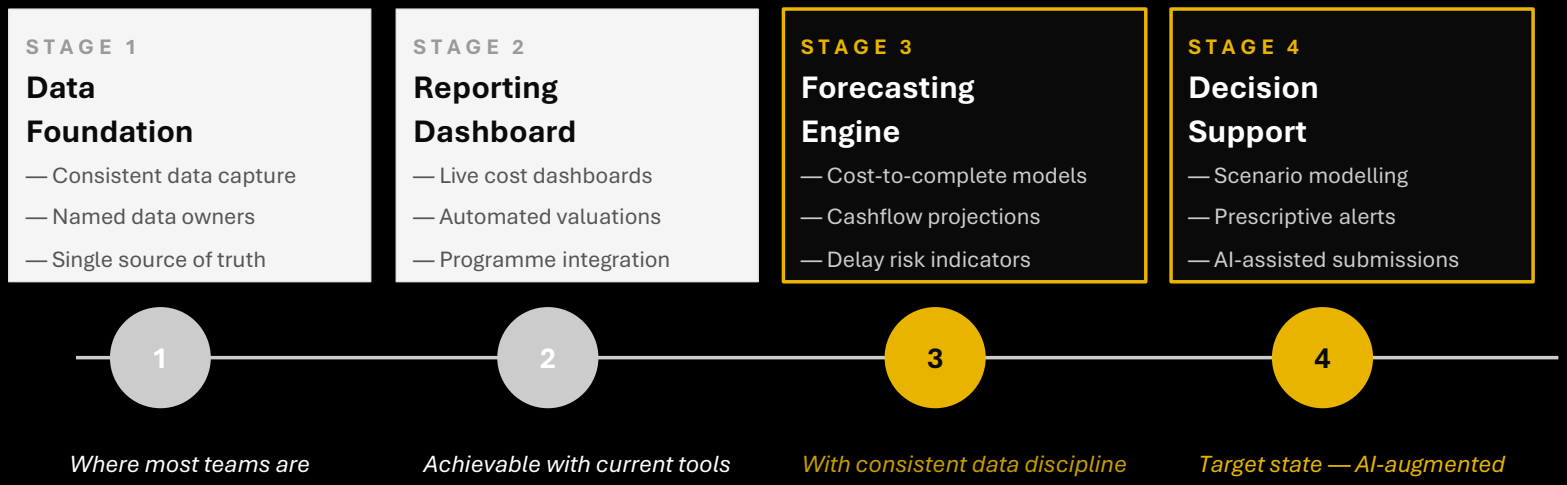
The model flagged a £1.4M exposure at Month 5 — giving 5 months to intervene before final account.

05

From Dashboards to Decision Support

Maturing your capability progressively

The Analytics Maturity Journey



Start with Stage 1. You cannot forecast reliably from inconsistent data.

Project Manager
Stages 2–3: programme integration, delay risk

QS / Cost Manager
Stage 3: cost-to-complete, cashflow, change pipeline

Commercial Director
Stage 4: scenario modelling, board-level visibility

Where AI Supports — and Where It Doesn't

AI / Automation Adds Value

- Processing large datasets faster than manual review
- Spotting patterns in productivity or cost data
- Generating draft cashflow scenarios from actuals
- Flagging anomalies in subcontractor invoices
- Structuring and formatting report submissions

Human Judgement Stays Central

- Interpreting contractual entitlement and risk
- Negotiation strategy and commercial relationships
- Validation of model outputs against site reality
- Accountability for submissions to clients/funders
- Managing disputes, claims and final accounts

AI augments the commercial professional. It does not replace judgement, accountability or expertise.

06

Governance, Explainability & Audit Trails

Using predictive tools responsibly

Five Governance Principles for Predictive Analytics

01	**Explainability**	Every forecast must be traceable to inputs. If you cannot explain why the model output a number, you cannot defend it in a submission or dispute.
02	**Validation Loop**	Predictions must be compared to actual outcomes. Unchecked models drift. A monthly calibration review should be built into standard commercial controls.
03	**Audit Trail**	Assumptions, inputs, model versions and sign-offs must be recorded and timestamped. This is especially critical for NEC Early Warning Notices and compensation events.
04	**Accountability**	A named professional must own and sign off every forecast. AI can generate the numbers; a qualified person must stand behind them.
05	**Avoiding Over-Reliance**	Models should inform, not replace, judgment. Teams must maintain the ability to challenge outputs — and recognise when conditions fall outside model assumptions.

07

Getting Started – Practical Next Steps

What you can do on your next project

Your Predictive Analytics Action Plan

Immediate (This Month)

1. Audit your data: where is it, who owns it, how current is it?
2. Map your change control process — identify where it breaks down
3. Identify one metric you wish you'd known earlier on a recent project

Near-Term (3 Months)

1. Implement a single live dashboard for cost and programme
2. Introduce a weekly constraint log linked to cost risk
3. Define the forecasting outputs your client actually needs

Developing (6–12 Months)

1. Build or adopt a cost-to-complete model with explainable inputs
2. Run first scenario test on an active project
3. Establish governance — named model owner, validation cycle

Questions & Discussion

Key Takeaways

- → Predictive analytics is not magic — it requires good data, clear process and human accountability
- → Start with data quality before deploying models
- → Dashboards are not enough: build toward forecasting and scenario capability
- → AI augments the QS and PM role — it does not replace judgment
- → Governance, explainability and audit trails are non-negotiable
- → Progressive maturity is the goal — not a big-bang transformation

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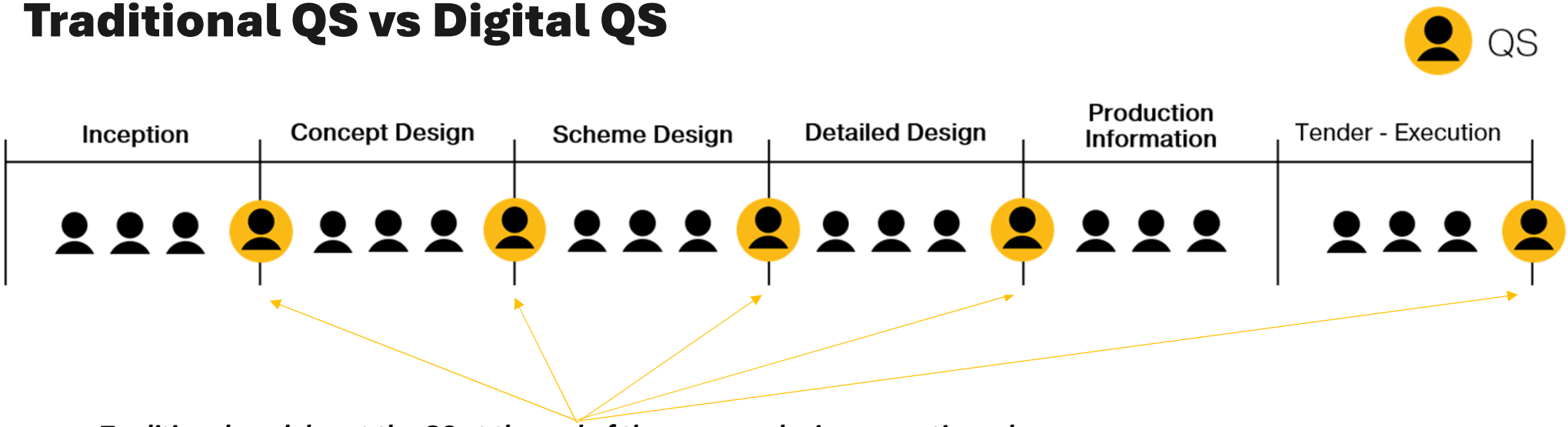
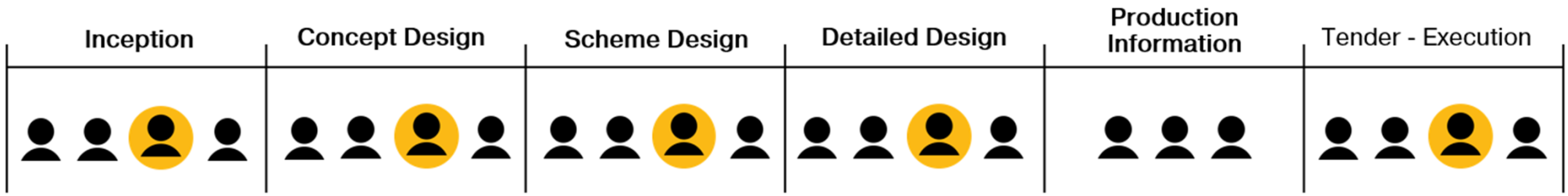
Traditional QS vs Digital QS



Traditional models put the QS at the end of the process playing a reactive role



Cost/Carbon is estimated while the design is ongoing, tracking live updates

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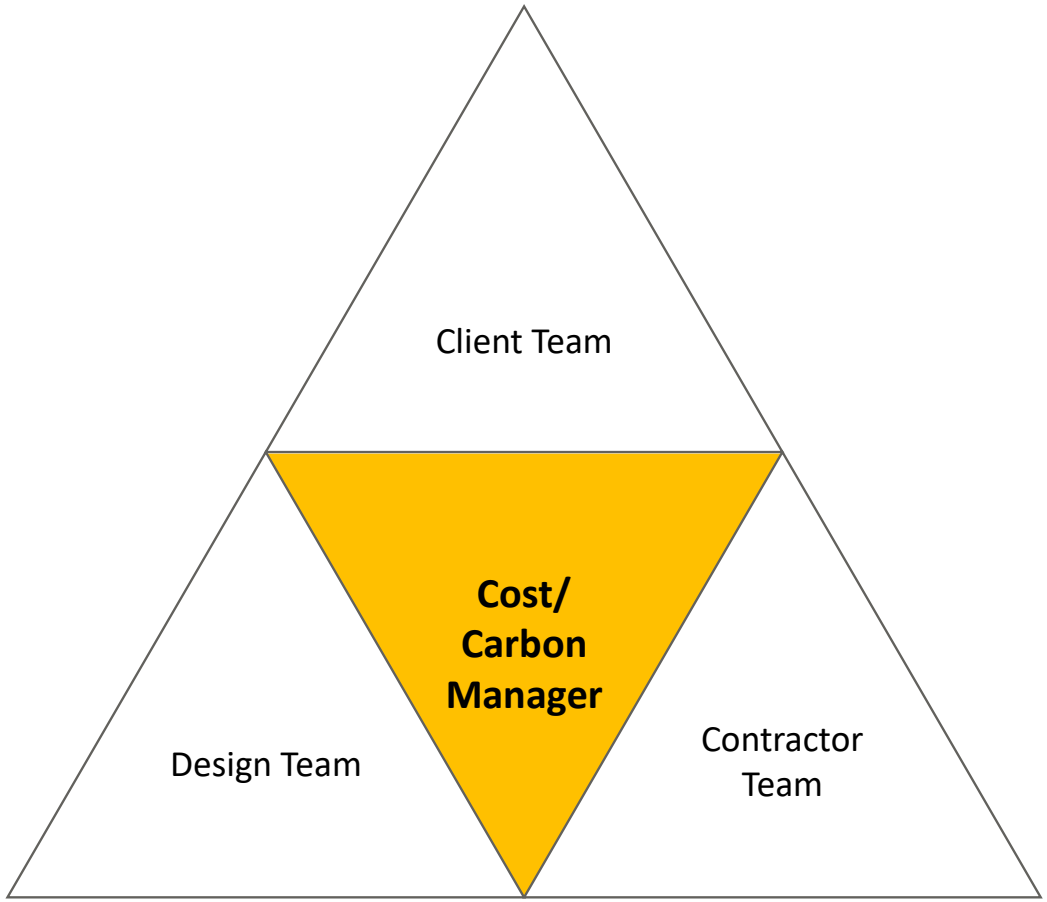
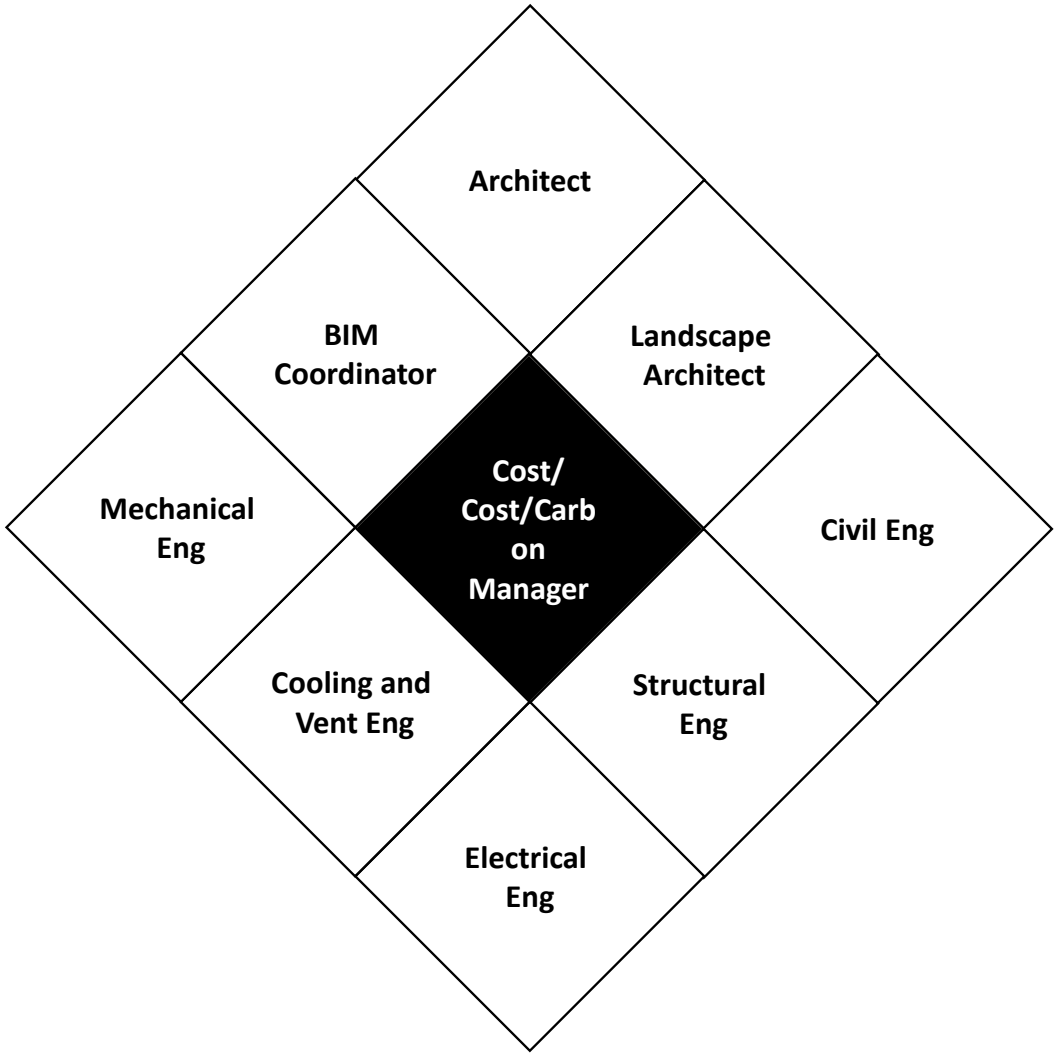
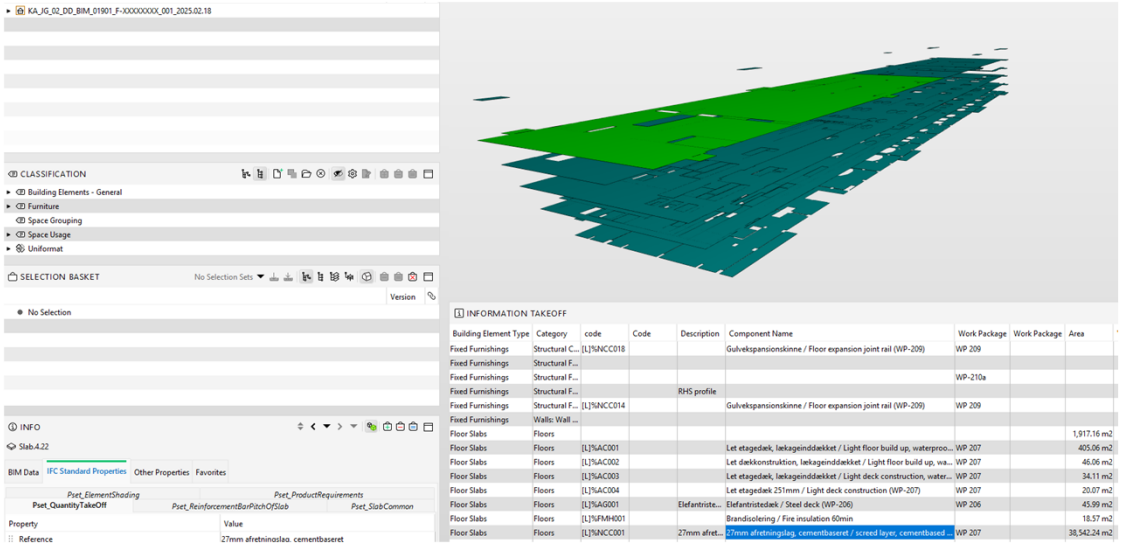
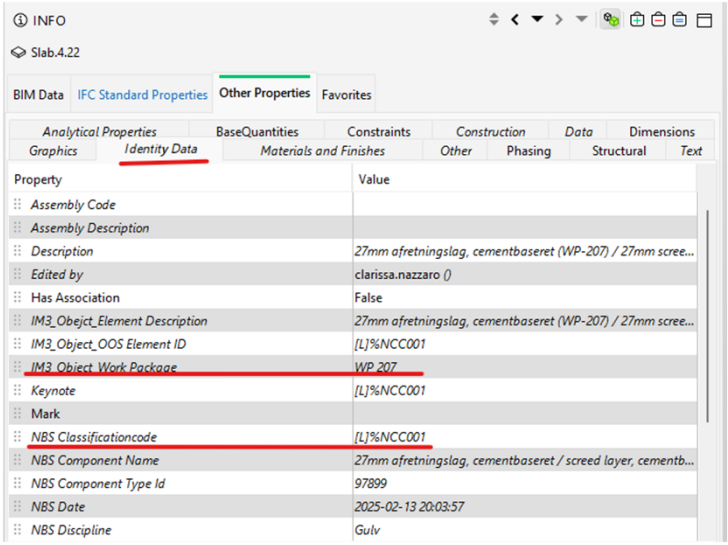
Collaboration and Communication





Quantity Take-off



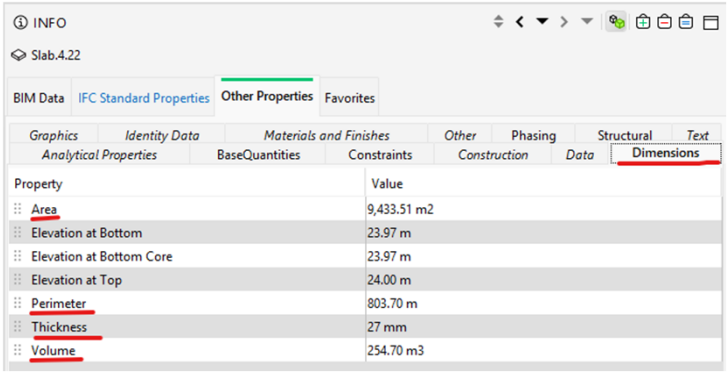


Pset_Quantity Takeoff

- Code
- Category
- Type name
- System (MEP)
- Dimensions (Area, Volume, Length, etc.)

Pset_Quantity Takeoff

- Building
- Demolition/ Existing/ New Building
- Work package
- Spec. reference



All Information should be gathered in 1 Pset_Quantity Takeoff for Cost Estimation/ BoQ

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Cost Estimation & BIM/3D

The Road Map

Cost & Carbon Roadmap

Early Design Phase

Concept design

- **Define the Cost/Carbon Baseline Budget and target**
- Assessment of potential Cost/Carbon driver
- Assessment of potential Cost/Carbon reducing opportunities
- Update of Cost/Carbon Management Plan
- Cost/Carbon Input
- **Delivery of Concept Design Cost/Carbon Estimate**

Basic Design

- Focus on major Cost/Carbon drivers and variant studies
- Assessment of potential Cost/Carbon risk and opportunities
- Close dialogue with design team on design & BIM quality
- Management and recording of changes
- Cost/Carbon Workshops
- **Update of Cost/Carbon Estimate**

Detailed Design Phase

Detailed Design

- Focus on major Cost/Carbon drivers and variant studies
- Monthly updates of Cost/Carbon
- Assessment of potential Cost/Carbon risk and opportunities
- Weekly/monthly meetings with BIM coordinator & discipline leads
- Management and recording of change of Cost/Carbon impact
- Including Cost/Carbon requirements in the tender document.
- **Delivery of Contract Design Cost/Carbon estimate end of phase**

Tendering

- Collaboration in preparation of Schedule of Works/ Bill of Quantities
- Assess & analyses contractor bids in regard to Cost/Carbon.
- **Incorporation of relevant requirements for materials and products into the tender material**

Construction Phase

Construction

- Analyze the Cost/Carbon effect of change and variations
- Analyze the Cost/Carbon effect of claims
- Cost/Carbon reporting to MS
- Assist contractor in delivering information for as-built Cost/Carbon calculation
- **As-built Cost/Carbon calculation**

Activities *Deliveries*

Project Timeline

- Cost/Carbon Baseline
- Define Cost/Carbon drivers & opportunities
- Cost/Carbon Estimate EIA input
- 1st Cost/Carbon Workshop
- Meeting with design team
- Variant studies
- 2nd Cost/Carbon Workshop
- Cost/Carbon Estimate
- Weekly/Monthly Meeting w BIM coordinator & DL
- Monthly update on Cost/Carbon
- Variant studies
- Tender requirements
- Cost/Carbon Report Phase 2.2
- Schedule of work (SoW) /Bill of Quantities (BoQ)
- Questions & Answers
- Tender Analysis
- As build Cost/Carbon calculation

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