



Uh Oh!

EVA 27 Presentation

Challenges of being an Estimating Practitioner in Turbulent Times

D.Jones 13/10/22

TURBULENCE



David Jones FRICS FACostE Background

David has over 20 years experience of working in numerous sectors as an engineering, risk and commercial leader. He has a passion for sharing and collaborating to enhance the costing and commercial professions demonstrated by the establishing cross UK government department and ACostE Estimating groups.

Sodexo Global Head of Costing – Current Role

Leading Global Implementation of a Global Costing Framework and costing capabilities to enable standardized costing.

ACostE Estimating and Cost Intelligence CoP Chair

- Leading the industry, public sector, academia and consultant cross-sector group resulting in an estimating training pathway that satisfies current and future costing and technical standards.

Cross-Whitehall Estimating/Pspace Group Chair

- Co-founded and chaired the group to share costing best practices and foster collaborative activity between Uk government departments to develop a standardized costing approach across government.

HS2 Head (of Profession) for Estimating, Benchmarking and Efficiency

- Costing functional and assurance lead for capability improvement activity, strategy and standard development.
- Conducted assurance activity and provided estimating, risk and benchmarking guidance on behalf of the IPA on High Complexity Programmes

QinetiQ Senior Cost and Risk Consultant

- Provided guidance, mentoring and assurance for

multiple programs in the aerospace, nuclear and defense domains.

D E Jones Engineering Ltd Cost Engineer

- Multiple cost engineering roles in the maritime and manufacturing sectors producing top-down costings, first principles estimates and risk collateral to support WLC, bid and budget production.

Royal Navy Chief Weapons Engineer, Submarines

- 12 years serving on submarines as a weapons maintenance engineer and procurement support roles.

Publication Contributions

- [IPA Best Practice in Benchmarking](#)
- [IPA Benchmarking Capability Tool and guidance.](#)
- [IPA Costing Estimating Guidance](#)
- [TIES One Year on Report](#) – E-track Benchmarking Model Case Study
- [RICS Global Professional Statement in Cost Prediction](#)

Current External work is on:

- BSI Project Controls Standard
- IFMA Sustainability top cities paper
- Sustainability Benchmarking

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What is an estimate?

“An estimate is an approximation, prediction or projection of a quantity based on the best available experience and/or information available the time with other pertinent facts that are unclear or unknown”

If the above statement is dissected;

“An estimate is an approximation, prediction or projection of a quantity based on the best available experience and/or information...”

In other words, an estimate is an educated guess using the most appropriate estimating methodology, data, people and tools available which will be selected based;

“....at the time with other pertinent facts that are unclear or unknown.”

Why are estimates created?



To provide as accurate as possible costs against a known scope of work.



To secure budget.



To assist in making sound business decisions.



To support business cases.



To understand cost and schedule.



To understand resource needs.



To challenge suppliers.



To inform risk provision.



To make "Make vs buy" decisions.



To identify or validate improvements and drive efficiencies.

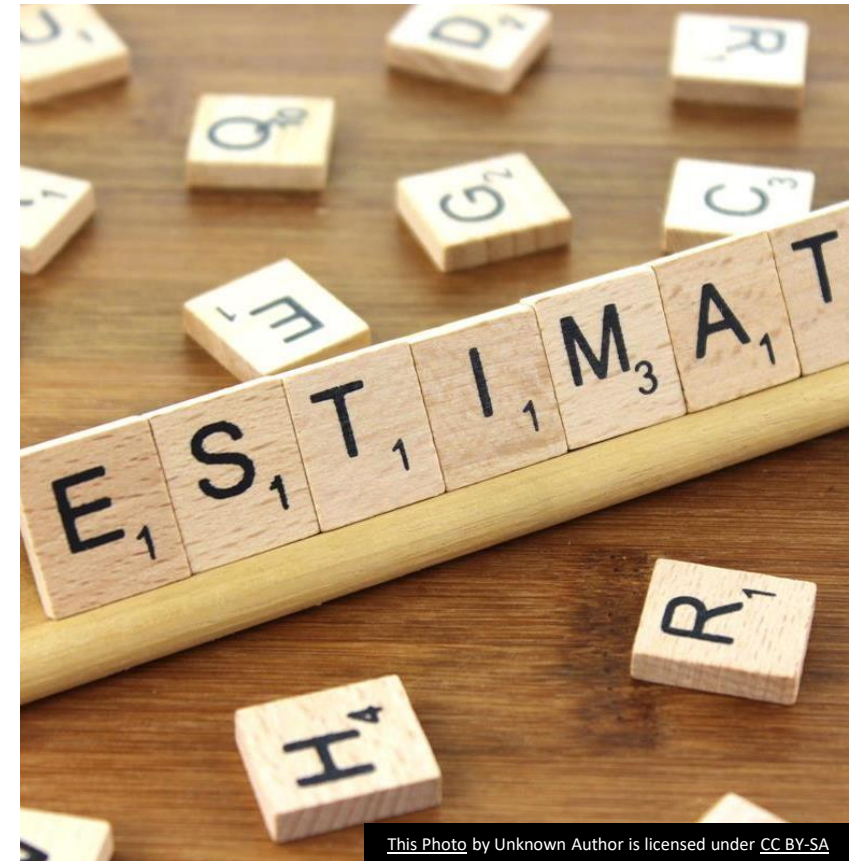
Key Reasons why estimates fail

The most common reasons that estimates are inaccurate are:

- ✘ Politics and pressures. Estimating low to improve the chances of your bid/project being accepted.
- ✘ Scope creep and failing to account for it; often the result of not having a clearly defined scope and/or not tracking and declaring changes to scope.
- ✘ Assuming efficiencies within the estimate before they have been realised.
- ✘ Poor estimate management and version control.
- ✘ Insufficient resource or time to estimate.
- ✘ Over-optimistic or incorrect assumptions.
- ✘ Lack of clear scope definition.
- ✘ Failure to define risks and uncertainties.
- ✘ Failure to consider the project context.
- ✘ Lack of estimation experience; estimates generated without the pre-requisite experience in estimating or the subject being estimated.

Key Challenges for the Cost Estimating Practitioner

- Cost Estimating Practitioners face numerous challenges when producing the “Single Number” that everybody anchors themselves towards.
- The estimator needs numerous skills, tools and support from Senior stakeholders to ensure that the final value is robust, attributable and can be communicated.
- Estimates are produced in an unstandardised and inconsistent manner, not prescribing the methods that should be used, how an estimate should be validated and how the estimate should be optimised.



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Provide a Standardised Estimating Framework

- It is vital that your estimating supports a standardised approach that incorporates built-in safety features for:
 - missed or unpriced items/scope of work.
 - Standard Assumptions, Dependencies, Risks, Opportunities and Exclusions
 - The correct and multiple methodologies are used based on the known level of scope maturity.
 - The level of governance and assurance is proportionate to the level of commercial risk by use of multiple costing methodologies, correct level of cost resource competency and fit for purpose tools.
 - Allows flexibility of entrepreneurial risk-taking in solutions and design to encourage greater productivity
- Benefits of using an estimating standard:
 - Using the most appropriate methodology reduces tendering cost and waste of effort i.e. using bottom-up estimating when there is a low level of scope maturity uses more effort than top-down costing.
 - The correct methodologies are used based on the known level of scope maturity.
 - The level of governance and assurance is proportionate to the level of commercial risk by use of multiple costing methodologies, correct level of cost resource competency and fit for purpose tools.
 - Enhanced costing accuracy is enabled as repeatability in methods and approaches are performed.
 - Risk is reduced and opportunity realisation probability is enhanced.
 - Development of a continually improving set of tools (through consistent use and application of learning and experience to refine the tool set)

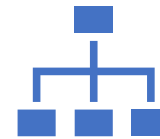
Lack of time

- Lack of time is usually cited by most estimators as their biggest concern when producing estimates as this can lead to rushing the completion of tenders, thereby increasing the risk of mistakes being made.
- The ability to be able to have more than one estimator working on an estimate, at the same time and without having to physically split the estimate, is therefore extremely important.
- The fast pace of modern projects and tendering means that time is at a premium and there is ever more pressure on estimators to produce estimates faster, thereby increasing the risk of expensive inaccuracies.
- Use the right methodology (top down, middle-up/down and bottom-up) based on the level of information and speed required but also multiple methods to allow proportionate assurance (2-3% contract value can be tender/bid costs).
- Share the bid pipeline with the estimating team so they can plan. Estimators know these timelines can change but they can adjust accordingly.

Just give me a number!



Sometimes, an estimator will be rushed or put under pressure to provide a number. This does not help anyone. The estimate generated is rushed and of poor quality to satisfy the stakeholder



Poor organizational behaviors such as “Tickbox” assurance or too much assurance waste an estimator’s time.



The assurance and due diligence process should support the estimator.

Undeveloped and poorly implemented Common/Standardised Coding Structures

- Not using a common coding structure means time wasted producing an estimate where there maybe scope gaps
- Poor use of coding structures means estimates and costs cannot be re-used to speed future estimates, allow cost management and then ultimately development of credible benchmarks.
- Data cannot be re-used within an organisation or collaboratively with other organisations.
- Use coding structures such as ICMS, CESM, etc.



ICMS: Global Consistency in Presenting Construction Life Cycle Costs and Carbon Emissions

3rd edition, November 2021

ICMS Coalition

Quality of available data (from client and internally)

- Resource constraints challenge the quality and quantity of data that estimators can obtain internally or from clients.
- The estimator wants credible and defensible data but this may not exist.
- If data doesn't exist the estimator cannot magically produce data. For example when you purchase a new car, you don't just say I want a car with four wheels! Do you want EV, diesel, etc?
- Commercial and finance teams can sometimes be unwilling to share data, this does not help anyone.
- Most estimators are in professional bodies that have a code of conduct so there is no excuse not to share the information that will ultimately allow a more precise estimate to be generated.

Lack of investment in robust estimating tools

An engineer may need to reduce the cost of a component by 20% through design modifications. How do we quantify the impact of each design parameter for every alternative to meet the requirement?

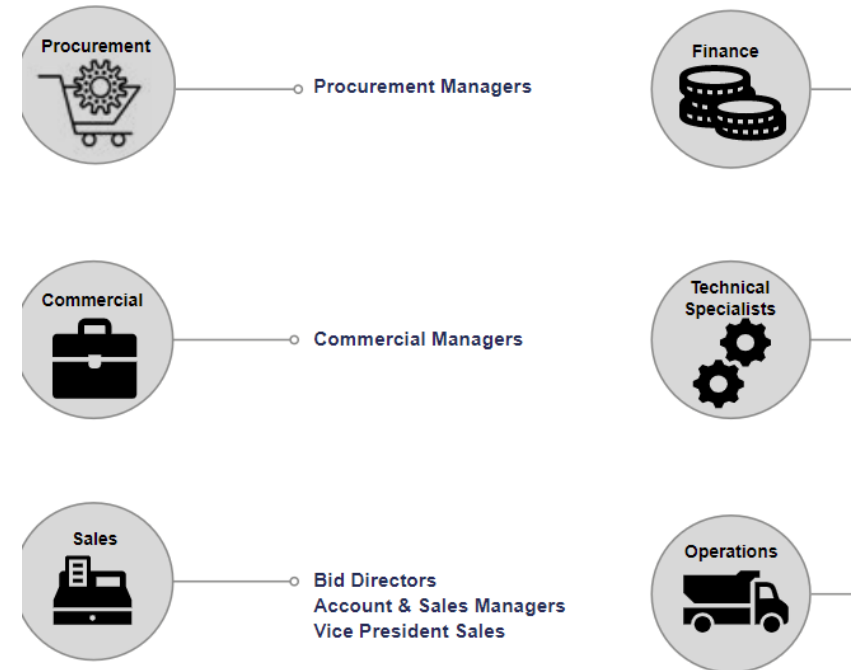
We need robust data that is then used to produce robust benchmarks and parametric models.

Depending on organisational size, this activity can take 12-18 months for an individual or team to produce benchmarks and/or parametric models.

This can be seen as not worth the investment – it should be noted general ROI for most of these types of tool are at least 100:1

Lack of organizational costing training

- Most support/back office functions within an organization use an estimate, whether this is to:
 - Produce a tender
 - Build a Business Case
 - Performing Supplier Management
 - Engaged on procurement activities
- Having costing training means when you implement a standardized approach everyone understands what an estimate, cost and price is! This is even more important in multi-national organisations with language barriers.
- Solution – Use the Acoste Estimating Training Framework (at the end of this slide-pack)



Scope creep or change/Out of-date information

- The estimate is only as good as the latest scope given to the estimator.
- If the scope has changes and this hasn't been communicated or shared with the estimator, the estimate won't be updated!
- If Assumptions, Dependencies, Exclusions, Risk or Opportunities are changed and are not centralized how is the estimator expected to produce a robust estimate.

Does the estimate reflect what is in the contract?

- There is a tendency not to share all the information with an estimator!
- How can something be estimated if not all the information is provided!
- Share all standard contractual liabilities, requirements and considerations with the estimator
- What is the contracting method/vehicle?
 - The estimate and cost risk should be reflective
 - Are the economic risks such as inflation, material prices, etc updated and communicated to the estimator?

How do I help my organization tackle all these challenges?

- Have an estimating Standard that details
 - What is the estimator expected to do with what tools,
 - How the estimator should produce the estimate
 - Detail assurance/due diligence that is required and whom it is intended for
 - How and at what level should the estimate be communicated at
- Implement Basis of Estimate – Provide a clear, attributable, transparent and robust structure to the estimates
- Have quality benchmarks (internal or external) that can be used to sense-check the estimates
- Clear roles and responsibilities for the estimator and boundaries, i.e. will he include management in the estimate, or will finance
- Detail self-checking the estimator should perform, such as Sensitivity Analysis, cost participation analysis, variance analysis, etc. This will help flesh out key areas
- Have an integrated approach – Cost, Schedule and Risk
- Update the estimate – the estimate is a live document and key to managing contract/project performance
- Proportionate assurance – risk-balanced approach to testing and challenging an estimate
- Centralise all the collateral so everyone can find the resources

Summary - Benefits of Standardising



Responsible Management: Better decisions.



Improvements identification and opportunity to reduce costs.



More stable resource plans.



Better understanding of scope definition and control.



Less time spent on fire-fighting and recovery activities.



Better negotiation position with contractors.



Focusing on what is important - because you know what is important.



Better trade analysis.



Better understanding of risk.



Ability to make reliable commitments.



ACostE Estimating and Cost Intelligence Community
of Practice (ECIC)

Estimating Training Framework



Content

- ACostE ECIC CoP – Who are we?
 - Why having an Estimating Training Framework and what is its purpose
 - What is an estimator?
 - The Complete Estimator
 - Core Estimator Skills Matrix
 - Cost Estimating Training Standards and Pathway
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ACostE Estimating and Cost Intelligence Community of Practice



Currently the Estimating and Cost Intelligence Profession is embedded within many sectors and is integral to the success of public and private sector organisations. The estimating and cost intelligence professional must have a varied skill set to enable them to do their role. Some of the key skills that the estimator requires are:

- ▶ Technical
- ▶ Financial
- ▶ Data Science
- ▶ Commercial
- ▶ Communication
- ▶ Leadership

Traditionally the estimator will use these skills and the sector estimating knowledge to produce an output that supports the business case or bid.

How does an estimator acquire these skills or learn about other estimating techniques from another sector that would be more appropriate than the traditional sector technique. Or where does an estimator go if they need some advice or guidance from someone outside their organisation.

The answer to the above challenges is the ACostE Estimating and Cost Intelligence Community of Practice!

ACostE Estimating and Cost Intelligence Community of Practice

What is a Community of Practice?

A Community of Practice (CoP) is defined as: “A group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.” CoP’s are usually informal, self-organising, and span across departments with members distributed throughout an organisation.

To that end, the purpose of this Estimating and Costing Intelligence Community of Practice is to create a structure that allows our staff to promote good practice and build common capability in costing across the profession.

The purpose of the CoP is to:

- **Working together**
 - Create a Community of Practice
 - Share good, best and leading practice
- **Promoting Estimating and Cost Intelligence Best Practice within all Sectors and Stakeholder Types**
 - Review how we can align with and link into existing good/best/leading practice
 - Communicate Costing messages and raise the visibility of the estimating profession
- **Building capability**
 - Promote values, culture and estimating profession
 - Share Best Practice to Support business decisions



Why have an Estimating Training Framework and what is its purpose?

The Estimating Training Framework provides a consistent approach to cost training in order to provide a clear progression pathway aligned to known standards for all costing professionals or those that have costing in their role.

What is a Cost Estimator?

“A cost estimator is someone who defines a project’s or contracts cost based on the estimate of resources, time, information, material, and equipment required for completing the project/contract.”

Within the context of defining what an estimator is, we must also consider the experience level. Four key tiers are proposed, which should be generic across most industries, commencing with awareness with a trainee to full authority with a well developed estimating career.

In addition to core estimating skills, as a career progresses, broader knowledge is required to be developed in industry wide issues, project working, engineering design and information and additional skills associated with data, mathematics, statistics and commercial issues.

Level	Skills
Awareness	Project cost estimation; Cost analysis and presentation
Practitioner	Project cost-related decision-making; Risk management; Cost control and Planning; Investment appraisal
Expert	Project cost management; Project control
Authority	Business cost management; Business contracts

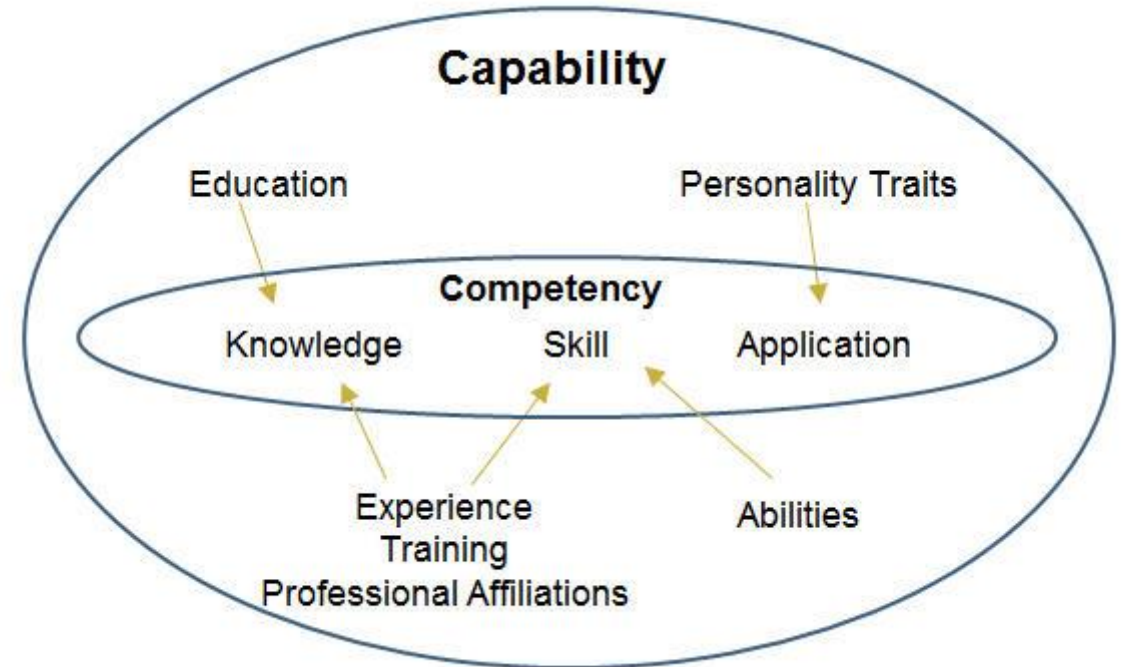
The Complete Estimator

When considering the full extent of knowledge that must be developed during an estimating career, a wide and diverse skill base is required. These include both estimating core **Skills** but additional **Capabilities** that will allow effective working and communication with fellow team members.

Competency is derived from the **knowledge** held and possessing the **skill** to apply this knowledge to the different **applications**.

Capability is derived from the formal education and training one undertakes combined with the necessary soft personal skills to allow the formal education to be applied.

Therefore to develop a competent and capable estimator requires a formal education, experience and the soft skills necessary to communicate and interact with others.



Core Estimator Skills Matrix

A study was conducted by the ECIC Steering group of literature and formally published documents to determine the key sets of skills required.

In addition, other skills that are needed to be developed, such as engineering knowledge, manufacturing techniques and overall project fundamentals are needed to fully understand the role of estimating in context of industry. The extent of knowledge need in each subject area will vary between both industries and level of the estimators position within the cost team.

Highlighted in orange are skills that the Framework identifies as the key skills required at the different estimating and cost intelligence seniority levels.

Core Skills			
Cost Estimating	Data	Risk	Finance
General concepts	Database	Risk Analysis	Investment decision
Processes and practices	Analysis	Management	Time value
Resource management	Configuration	Contingency	Cashflow
Elements of cost	Infographics	Uncertainty	Business case development
Cost classifications	Collection	Accuracy	Value analysis
Cost typologies	Normalisation		Lifecycle costing
Quantification	Statistics and Probabilities		Accounting
Estimate Methods			
Contextual Skills			
Project Skills	Engineering	Commercial	Workmanship
Planning	Project engineering	Contracts	Manufacturing
Resource management	Manufacturing	Procurement	Constructability
Project management	Constructability	Bidding / Pricing	Production
Performance measurement	Engineering information	Business law	Work measurement
Change management	Modelling	Budgeting	
Project implementation	Asset Management	Claim management	
Scope definition	Value engineering		
HSEQS			
Execution strategy			
Behavioural Skills			
Supporting Skills	Competencies	Interpersonal	
Mathematics	Presentation skills	Self-confidence	
Organisational	Ethics	Teamwork	
Technical report writing	Responsibility	Communication skills	
Stakeholder	Organisational	Assertiveness	
Information Technology	Decision making	Influencing and coaching skills	
	Negotiation skills	Leadership skills	
	Effective briefing	Facilitation skills	
	Interviewing techniques	Human relations and behavioural	

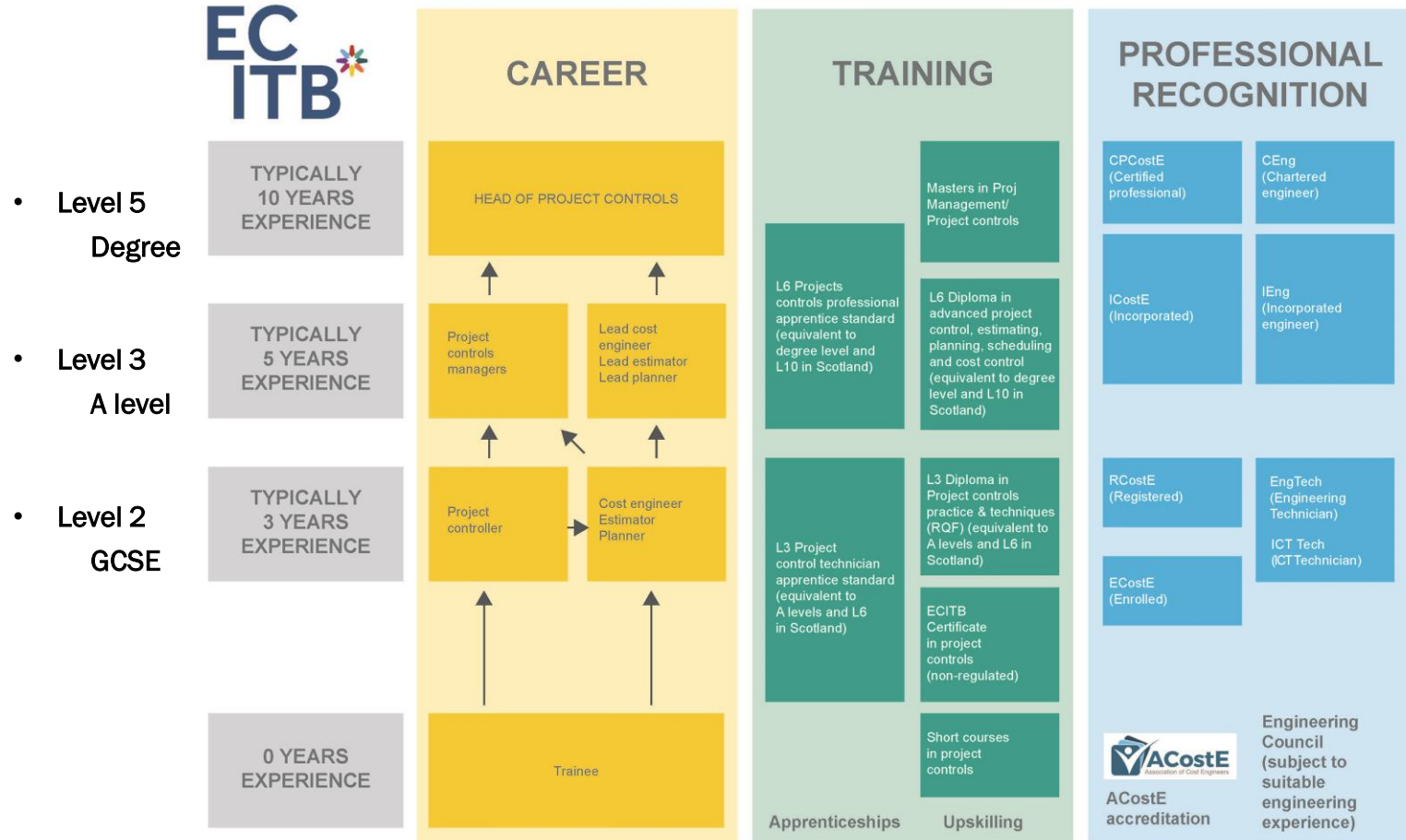
Cost Estimating Training Standards and Pathway

The Steering group has considered available training standards and following the long standing association between the ACostE and ECITB, the group recommends following the ECITB training standards.

The ECITB also possess a formal training structure which can result in an estimating career path that can leads to a full engineering chartership.

The Engineering Construction Industry Training Board (ECITB) works with employers and training providers to give the engineering construction industry workforce the skills it needs to meet the challenges of the future.

They invest around £25 million each year supporting employers to attract, develop and qualify their people in a wide range of craft, technical and professional disciplines. This includes a focus on attracting, developing and qualifying project controllers, estimators, planners, schedulers and cost controllers.



ECITB Estimating and Commercial Training Standards

In addition to the training standards specific to estimating, the ECITB possess standards in many of the aligned subjects such as risk, engineering information, project controls, scheduling, cost management and commercial awareness. There are other standards and professional statements that should be consulted such as the RICS – Cost Prediction Professional Statement.



Level 2 Training Standards		Level 3 Training Standards		Level 5 Training Standards
TS PC02-01	Introduction to Project Controls	TS PC03-01	Project control overview	There are 23 Level 5 Training Standards – here are the first
TS PC02-02	Introduction to Commercial Awareness and Risk	TS PC03-02	Breakdown and coding structures	TS PC05- 01 Manage effective application of quality processes and IT
TS PC02-03	Gather and Process Data for Project Control Activities	TS PC03-03	Project control reporting and related governance systems	TS PC05- 02 Scoping and requirements definition
TS PC02-04	Introduction to Monitoring, Forecasting and Reporting	TS PC03-04	Monitoring risk, opportunity and uncertainty	TS PC05- 03 Acquiring and acting on information
TS PC02-05	Introduction to Quality Management Systems and Change Management	TS PC03-05	Monitoring, tracking, forecasting and reporting project progress	TS PC05- 04 Risk analysis and management (including opportunity and uncertainty)
TS PC02-06	Introduction to Estimating	TS PC03-06	Commercial awareness and planning procurement activities	TS PC05- 05 Maintaining, controlling and reporting on project progress
TS PC02-07	Introduction to Planning and Scheduling	TS PC03-07	Financial controls and techniques	TS PC05- 06 Task & project close-out
TS PC02-08	Introduction to Cost Engineering	TS PC03-08	Estimating practice	TS PC05- 07 Advanced estimating practice
TS PC02-09	Communicating with Stakeholders	TS PC03-09	Planning and scheduling practice	TS PC05- 08 Advanced planning and scheduling practice
TS PC02-10	Introduction to Health & Safety, Environmental, Ethical and Behavioural Procedures	TS PC03-10	Budgeting and cost control practice	TS PC05- 09 Advanced budgeting and cost control practice
TS PC02-11	Introduction to Self-development	TS PC03-11	Supporting construction or manufacturing planning	TS PC05- 10 Interpreting and applying financial controls
		TS PC03-12	Optimisation and efficiency	TS PC05- 11 Leading the establishment of construction or manufacturing plans
		TS PC03-13	Generating and using statistical data	TS PC05- 12 Earned value management
		TS PC03-14	Using learning curve models	TS PC05- 13 Advanced optimisation and efficiency practice
		TS PC03-15	Communicating with stakeholders	TS PC05- 14 Analysing and interpreting statistical data
		TS PC03-16	Professional ethics	TS PC05- 15 Developing and calibrating learning curve models
		TS PC03-17	Professional development	

Commercial Awareness Training Standards	
TS CA 01	01 An introduction to commercial awareness for the engineering construction industry
TS HCA1	01 Setting up engineering construction projects in a modern contracting environment
TS HCA1	02 Understanding key commercial contract terms and provisions in an engineering construction project
TS HCA1	03 Managing commercial expectations of an engineering construction project
TS HCA1	04 Managing commercial performance of an engineering construction project

Standards Wording

The ECITB standards follow the same subject area, although the depth and breadth changes as the level increases.

These changes are normally conveyed by changes in the use of verbs to show the increased level of skills and knowledge required.

Level 5

- Assure and control
- Oversee
- Determine
- Develop
- Acquire and handle
- Identify, analyse, evaluate
- Ensure

Level 3

- Apply
- Retrieve
- Prepare
- Carry out
- Calculate
- Plan
- Contribute

Level 2

- Support
- Follow
- Process
- Work

Future Estimator Skills

As the world develops and makes better use of data and advanced manufacturing techniques, along with resulting issues from climate change, the skills of the estimator are likely to change.

Part of the work of the group is to consider where these skills may need to be developed, and how training in the future will need to evolve to address them.

Future skills are likely to mean that the estimating function may splinter into data analysis and technical specialist considering how components need to be married. The project estimator is more likely to become a data manager, pull in and combining opinions and outputs from other specialists to form an overall cost picture.

These skills will be updated in future revisions of the ECITB standards and as such contained within updated versions of the Framework to prompt future discussions.

- 
- Statistics
 - Programming knowledge
 - Data Manipulation and Analysis
 - Data Visualization
 - Machine Learning
 - Deep Learning
 - Big Data
 - Future Technologies – Digitisation, Modern Methods of Manufacturing,
 - Environmental Sustainability
 - Social Value
 - Model Deployment
 - Carbon Estimating

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