

A D Crossley
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Good afternoon ladies and gentlemen. My name is Andrew Crossley and I am from a management and advisory services business called ServQ. We work with CICE here at Loughborough in the field of programme metrics, which is the subject of this presentation.

Along with many other Industry practitioners we have observed the generally ad-hoc, or sponsor specific nature of selection and performance measurement for programmes. That is not to decry the professionalism of the teams carrying out the selection but recognises the "silo" effects apparent within specific industry sectors and organisations.

The cost of preparing and using these bespoke processes is significant to the Clients in terms of professional fees paid to legal and surveying firms to prepare one off assessments.

Consultants and contractors incur major costs in preparing and delivering different sets of documentation.

Further down the supply side sub-contractors and suppliers need to comply with both the Clients requirements and usually with additional demands from the consultants and contractors.

Hence an independent cross sector evaluation tool has merit if it can save cost and time and be used as a core approach by different Clients and their construction teams.

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Impact of programmes

- Clients shifting towards multi-projects and programmes:
 - Fewer Client based resources
 - In-house managers have to be up-skilled
 - Assembling projects into groups saves money and administration

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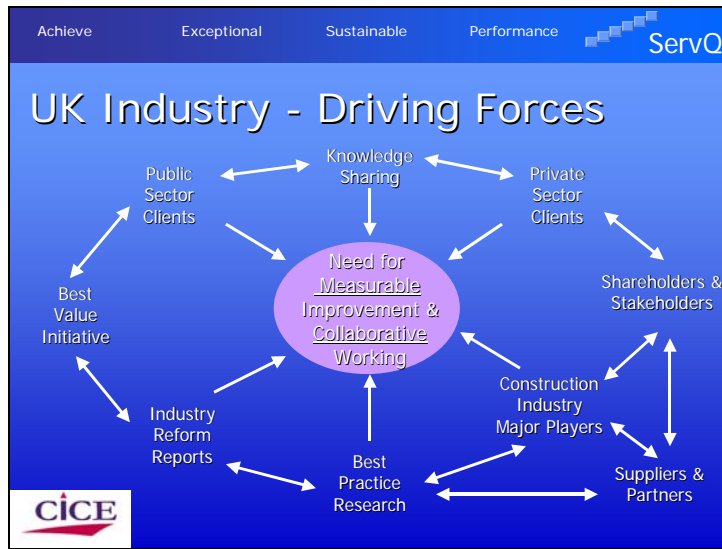
There is a distinctive shift visible amongst major public and private sector Clients towards packaging work into programmes rather than assembling teams for discreet projects. Why is this the case?

Firstly, there are **fewer Client employed resources** to handle asset-based investment. This creates significant pressures on these key individuals to deliver more projects per person, of better value, with less physical resources available in-house to help. They want to spend less time on procurement and more time on delivery.

Secondly, **programme managers are being up skilled** through training and development or even recruited into the Client organisations to build a body of knowledge and experience that is repeatable and captured. In the UK Network Rail has been bringing the core programme management skills back in-house, for example.

Thirdly, given the high cost of sourcing and employing good project managers (reflecting their high wages and even higher overhead recovery requirements), **assembling groupings of projects into programmes saves money**. This also forms part of the decision criteria to employ directly or source from outside. It is generally considered better value to employ directly in a project intensive and/or asset based environment.

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So let us review the driving forces for change, innovation and performance enhancement within the infrastructure industry. PUBLIC SECTOR CLIENTS, who are responsible for 37% of a £75 billion industry, recognise that they have a major position in championing industry reform – and in receiving better value for each £ they spend. PRIVATE SECTOR CLIENTS who invest some £47bn pa, whilst being highly commercial in their investment decisions, also want to get better value from their assets.

In response to these demands MAJOR PLAYERS IN THE CONSTRUCTION INDUSTRY, have been making significant strides to improve their perceived and actual performance. This is through a combination of better training and becoming more client orientated, especially at the “front end”. SHAREHOLDERS AND STAKEHOLDERS of contractors and their clients expect improvement in sustainable share earnings growth, better asset value and performance.

There has been a whole series of REPORTS ON INDUSTRY REFORM over the last decade from constructing the team (Latham in 1994) through to 2001s NAO report on Modernising Construction (available on the NAO web site). The government’s BEST VALUE initiatives impact on large areas of the public sector. All this influences the SUPPLIER COMMUNITY – which accounts for over 60% of the total infrastructure expenditure.

The demand for improvement has led to significant research into industry best practice - in process and product development (as witnessed by the success of the major institutions such as CICE, Salford, Reading, Bath, and Leeds to name a few). What has also become apparent – and it is most welcome – is the knowledge sharing and consultation between private and public sector clients (a positive spin off of the Public Private Partnership initiative).

All these stakeholders and their various initiatives have recognised the NEED FOR MEASURABLE IMPROVEMENT AND A MORE COLLABORATIVE STYLE OF WORKING. This is easy to state but not so easy to deliver, given the complexity of the industry and the impact of change on people, their communities, their employers and the environment.

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UK NAO 2001 – Key Challenges

- Needs to be a greater concentration on achieving a better construction which meets the needs of the end user at lower through life costs.
- The entire supply chain including clients, professional advisers, contractors, sub-contractors and suppliers of materials must be integrated.
- Manage risk and apply value management & engineering techniques.

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Source- Modernising Construction NAO 2001

I mentioned the NAO report called Modernising Construction. Some key challenges this laid down to the industry are:

- Much greater concentration on achieving a better construction, which meets the needs of the end user at lower through life cost;
- The need to integrate entire supply chain including clients, professional advisers, contractors, sub-contractors and suppliers of materials; and
- The management of risk and application of value management & value engineering techniques

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Supply chain broker role

<ul style="list-style-type: none">▢ Volume broker:<ul style="list-style-type: none">■ 80% of the market■ Cost management■ E-procurement■ Remove duplication■ Minimise waste■ <i>Transaction emphasis</i>	<ul style="list-style-type: none">▢ Innovative broker:<ul style="list-style-type: none">■ 20% of the market■ Knowledge based■ Technical demands■ Needs talent pool■ Trust/team based■ IT is lubricant■ <i>Client value & partnership emphasis</i>
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CICE Source - Professor Steven Male, Leeds University

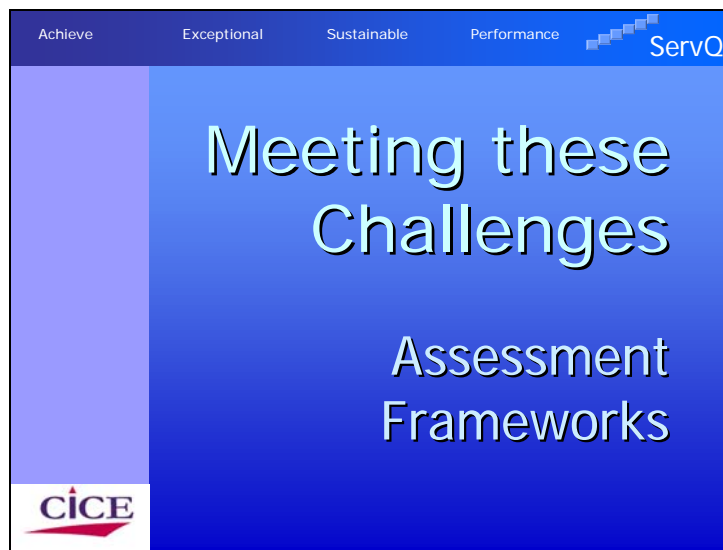
The concept of the supply chain broker role was proposed in a report co-authored by Brown et al in 2000.

The core competencies of the volume broker as typically those of a major construction group, where the procurement and systems expertise dominate. They have a transactional emphasis that is especially relevant to multi-projects I.e. programmes.

The innovative broker would deal with more complex engineering challenges by managing a network of leading edge supply chain members with a high degree of Client value and partnership emphasis.

A programme metric therefore needs to account for both of these emerging roles in terms of assessment and team building for effective delivery.

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Which takes us to the subject of assessment frameworks and their position in meeting these challenges.

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Good assessment frameworks

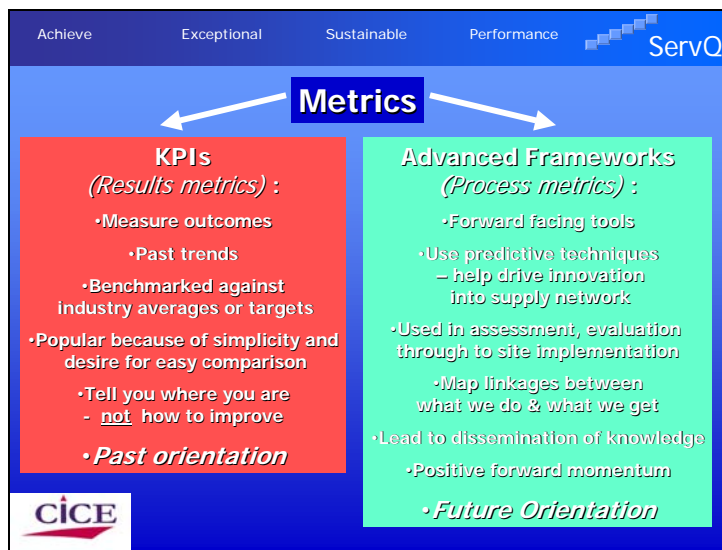
- Objective
- Forward looking
- Team/consensus building
- Real time business improvement tools
- Well researched & developed



Good assessment frameworks needs to be:

- Objective;
- Forward looking;
- Team building/consensual;
- A Real-time business improvement tools; and
- Well researched and developed.

Otherwise they will not satisfy the core requirements of the industry stakeholders and help meet the challenges of industry reform.



We are often asked about KPIs in the context of performance metrics.

In a paper published in Construction Marketer last winter – we highlighted that Key Performance Indicators (KPIs) measure outcomes i.e. historic performance and past trends - rather like a profit and loss account and balance sheet give an historic record of company performance – after the event. KPIs are therefore *results metrics* that benchmark the outcome, usually against an industry average or target. Their popularity with management and Clients relates to their relative simplicity in application and the desire for easy comparison.

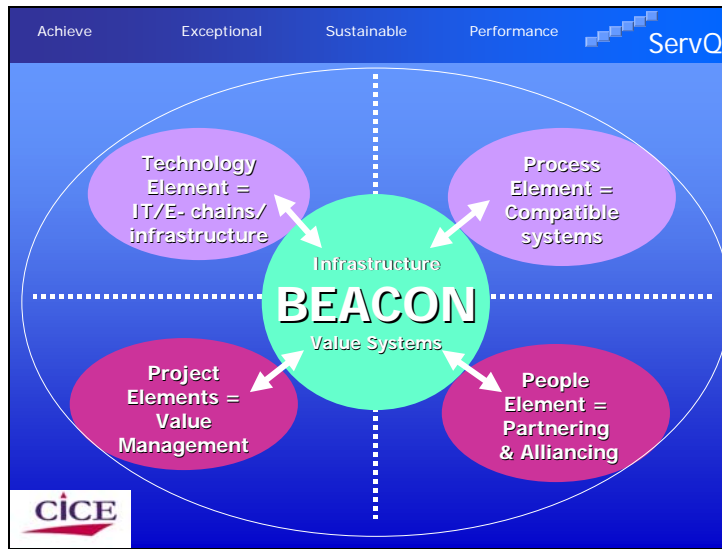
Some infrastructure industry KPIs refer to the outcomes of projects completed up to 2 years prior to the KPIs publication date. Normal project timelines from feasibility to construction are typically 3+ years. Current KPIs are therefore reflecting the evaluation selection, design and management practices of 5 years ago.

Given sector investment decisions, changes in client/supply side ownership and industry procurement dynamics, this is comparing the performance of a 5-year-old product with one planned for release in 3 years time – a potential quantum difference. This is always a challenge with lagging *results metrics*. KPIs have a past orientation.

Advanced frameworks are generally *process metrics*. They are 'forward facing' tools and use predictive techniques that help drive innovation into the supply network from the assessment and evaluation stages through to site implementation. They map out linkages between 'what we do' and 'what we get'. Successful application and implementation leads to dissemination of knowledge to additional teams, creating a positive forward momentum.

Both metrics have a place in infrastructure but the differences are important to understand. Process metrics have a future orientation.

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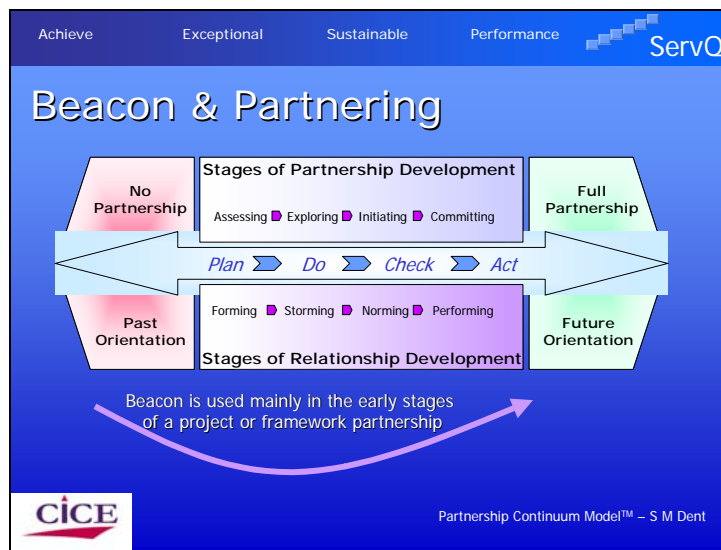
We discussed the volume broker role dominated by purchasing power. This will need advanced IT (for E-chains) (let's refer to this as a **technology element**). This market has been developing very quickly with several good quality software offerings available – the most flexible of these being web based systems. Good technology is needed, together with a trained and skilled user community (which is often overlooked).

For several years there has been an emphasis on the **process element** via QA questionnaires seeking out compliance information and intelligence. Compatible processes are important for audit, performance and traceability.

On an earlier slide the UK NAO identified the need to integrate the team. The report recognised the power of **people** especially *partnering and alliancing* in establishing a professional collaborative approach. The NAO also highlighted the need to use *Value Management approaches* to focus on delivering best value in whole life costing terms for the **project** and in understanding Client Value Systems.

So how do all these elements combine in a concurrent environment? This is where BEACON comes in – as a strategic and objective measurement, evaluation and performance-enhancing framework i.e. an improvement tool. BEACON stands for Benchmarking and Readiness Assessment for Concurrent Engineering in Construction.

In IT and advanced manufacturing Concurrent Engineering has brought significant improvements to many aspects of production. Assessing the extent to which organisations are ready to collaborate and integrate prior to implementation has helped map out and facilitate fast track production. The potential challenges are identified right up front and the team can implement joint improvement processes.



Concurrent Engineering in manufacturing focuses on two elements - *process* and *technology*.

This is too rudimentary for the infrastructure sector, which is acknowledged as being heavily dependent on people and their collaborative team skills to deliver successful projects that satisfy Client needs and wants. Hence two additional elements for assessment are required: *people* and *projects*.

Here we will look at these two additional elements. Firstly from the collaborative perspective (people element), BEACON links closely with advanced partnering metrics. Here for example we have the Partnership Continuum framework successfully deployed by the likes of NASA, Bank of America, Maryland and Minnesota Highways departments and many other major organisations. This is a powerful combination of high quality metricated and objective frameworks for programmes.

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BEACON & Value Management

- Value Management
 - Usually the project team is in place
 - Focuses on project business and technical issues
 - Establishes "project" agenda
- BEACON
 - Helps select the project team
 - Focuses on team integration & collective performance
 - Delivers improvement and helps cement the value chain

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Secondly focussing on the Project/Programme element leads us into Value Management

Value management is a powerful tool/process to develop whole life best value approaches. It tends to kick in as a project team is in place and the business case proven.

BEACON is highly complementary to VM in that it gets the right people in the room and focuses on integration and collective performance – it cements the value chain.

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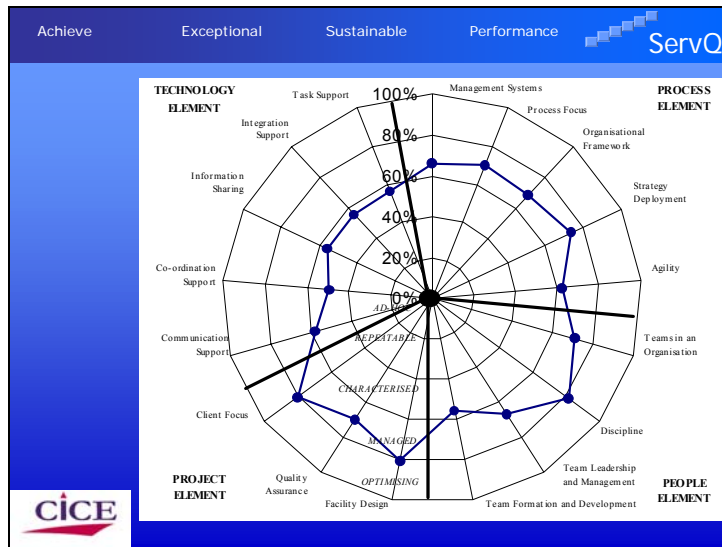
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So what is the
BEACON
process?



So what is the process and why should we invest in Concurrent Engineering – in this case the BEACON derivative?

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This is an analysis for a Client group.

As you can see the four elements (process, people, project and technology) are broken down into several critical factors. Each of these critical factors is initially measured, during the appraisal stage, to assess a participant's likely performance and the 'hot spots' for potential improvement identified. If the gap between the applicant's current assessment and the Client's programme need is too great, that organisation may not be appropriate for selection. There are 5 different levels of performance indicators from **ad-hoc** to **optimising**.

The tool can be used to:

- Help client's initially evaluate their own situation
- Derive their relative weighting of importance for the elements and
- Provide early identification of areas needing improvement

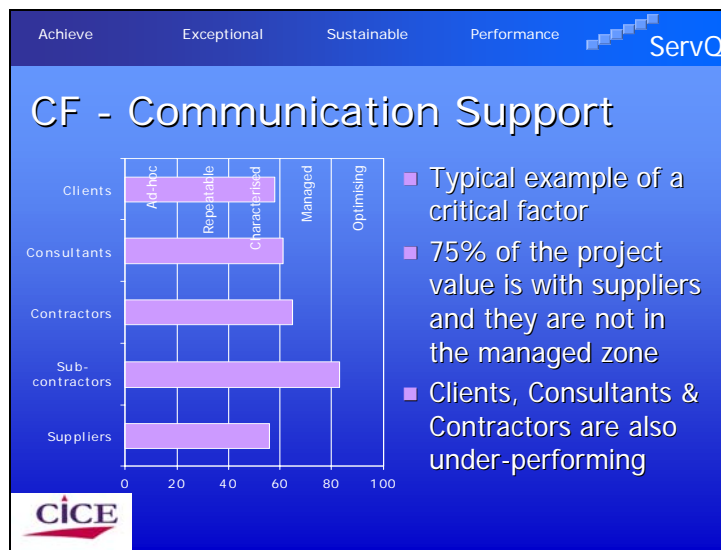
Then, having metricated the Client's "value systems", agree where they are likely to impact on the supply chain of:

- Professionals;
- Contractors;
- Sub-contractors; and
- Suppliers.

The programme participants are not necessarily assessed in this sequence. It depends upon the procurement/contract strategy.

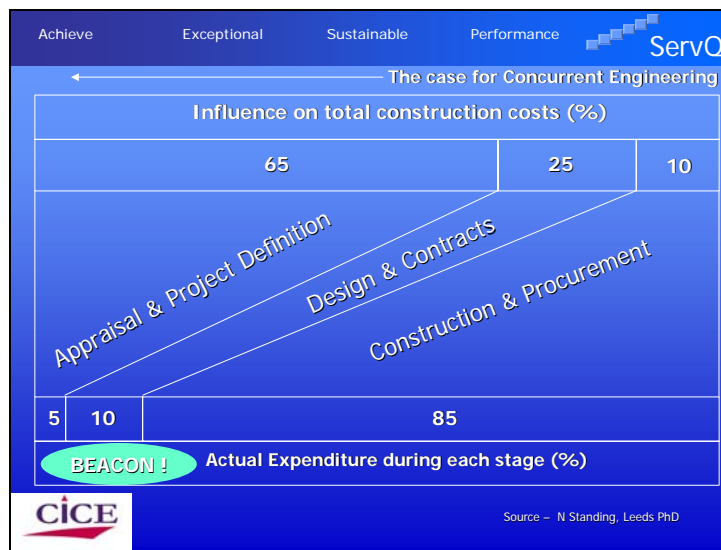
The BEACON framework gives us:

- Individual measurement and improvement (if re-assessed over time)
- Prioritisation and comparison
- A cross-sectional diagnostic and agenda for supply chain "hot-spots"
- A forward looking/improvement orientated programme



By way of illustration, we have picked out one critical factor (communication support) from within the “technology element” and abstracted a supply chain evaluation.

This is an example – individual measures will be different between businesses and for different teams.



In order to highlight a few points that reinforce the need for early supply chain involvement let us examine a graphic sourced courtesy of Professor Steve Male of Leeds University from an unpublished PHD thesis by Nigel Standing. It is quite revealing!

Under traditional procurement within infrastructure, the client and his professional team account for around 15% of the project cost. By adopting a compartmentalised "supply-chain" process, the scope for contractor and supplier innovation is very limited. Dr Standing suggests the construction team can influence circa 10% of the total cost and this is mainly in the area of temporary works and programme gains.

Concurrent engineering (and its BEACON derivative) enables time and business critical early involvement of the key players in the project or programme.

Hence a business tool such as BEACON to assist in the early evaluation and identification of team "hot-spots" is in reality essential, if we are to deliver better value and increase collaborative working.



Assessing and Improving

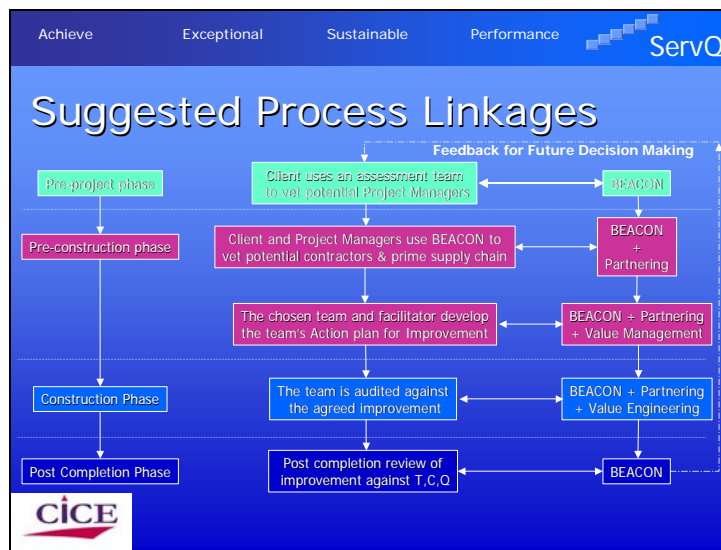
Stage	Action	Result
1	Initial assessments	Valid Input data
2	Processing of data	Factual reporting
3	Analysis	Identify SWOTs
4	Feedback and Workshops	Agree team priorities
5	Re-measure performance	Check actions taken
6	Post Project Review	Even better next time



Using BEACON our main interest is the intervention and impact i.e. *results*. We would recommend a 6 stage process starting with:

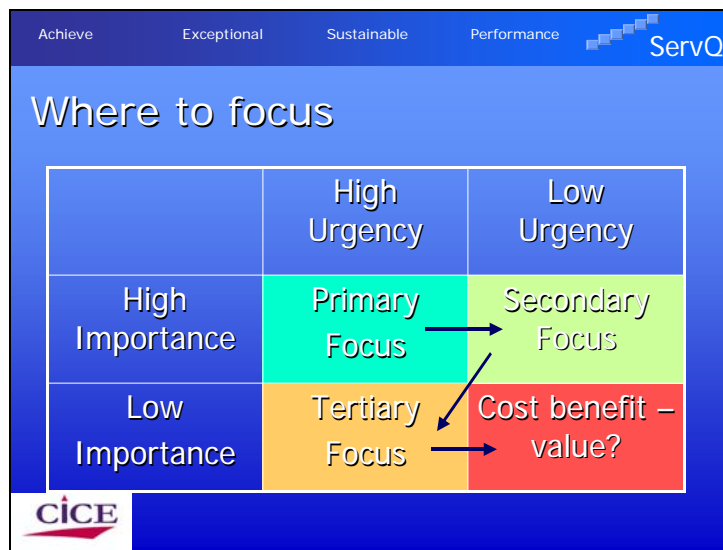
1. The **initial BEACON assessment**. This needs to be handled professionally and by trained assessors, to ensure the right questions are raised and objective results logged.
2. The **assessment is then processed** and a factual report produced.
3. An independent team then works with the client and supply chain to **analyse and determine** the supply chain's strengths, areas for improvement, opportunities to integrate further and any potential threats to under-achievement (**SWOT**).
4. ServQ/CICE's experience with both partnering and value management would recommend a **workshop** approach to agreeing and embedding priorities and necessary improvements.
5. After a suitable interval (depending upon the workshop's agreed programme) it is recommended that **re-measurement** takes place. Sometimes workshop teams agree programmes that are not implemented and secondly – we need to metricate the improvement against the cost of change.
6. Finally a **post-project review** is recommended – especially where a team is working under a framework/strategic alliance approach.

Clearly, the BEACON master data set will grow over time, as more clients, suppliers and projects are added. The database will therefore become more and more valuable for industry practitioners.



This is a typical process map for BEACON that explains the linkages with Partnering and Value Management:

- During the pre-project phase, BEACON helps choose the right project management team and facilitates transfer of the client value systems to that team.
- During pre-construction, BEACON and the Partnering Continuum process builds and reinforces important relationships between key representatives of the supply chain.
- That team can then work with a suitable facilitator to develop the project/programme action plans.
- During the construction phase the tools help audit the agreed improvement.
- Finally, post completion a review to assess the time, cost & quality of delivery - benchmarked against the BEACON evaluation - gives empirical performance data for future projects. This is especially important for a framework or programme.



As with most change initiatives we need to keep to the high importance elements and critical factors – as identified by the team.

There is always a cost/benefit analysis position - value management principles must therefore kick in and low importance/urgency items are likely to fall out of the evaluation and improvement agenda.

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So in summary

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Summary

Programme Needs	Element	Frameworks	Concurrent Engineering
Infrastructure Compatibility	Technology	BEACON + E-chains/extranets	
System Compatibility	Process	BEACON + Systems/Audit	
Meeting Client requirements	Project	BEACON + Value Management	
Relationship Compatibility	People	BEACON + Partnership Continuum™	

CICE Programmes need advanced frameworks and BEACON is the common link

We have 2 drivers for the volume broker role – infrastructure compatibility and system compatibility. These are assessed using BEACON to determine likely concurrency and performance.

In addition to the above we need to meet Client needs and build strong relationships (*especially for the innovative broker role* but just as applicable for advanced construction programmes). Here Value Management and the Partnership Continuum metric performance and drive the Client’s value and culture into the construction team.

In essence programmes need advanced frameworks, technology and systems and BEACON is a common link between them.

BEACON is an extension of concurrent engineering for construction.

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For you information you can access the presentation notes together with two articles/papers about BEACON from this website.

Thank you for your time and attention.