

CIO WORKSHOP

ON COLLABORATION AND INTEROPERABILITY

Asset Information as Key Driver for Operational Performance

CIO WORKSHOP 2007: AN OVERVIEW OF COLLABORATION AND INTEROPERABILITY DISCUSSIONS

The third annual CIO Workshop was held in Brussels on 19th and 20th September 2007. The continuing theme of the series, Collaboration and Interoperability, was maintained for this event. The specific focus of the Workshop was communicated by the tag line "The good news is you won the project ... The bad news is you won the project", which to the attendees resonated with a difficult position the construction engineering contractor finds itself facing all too often. The pursuit of a project can be marked by many things. It can be a time of creative leaps leading to promises based on imperfect information, or it can be a time of sober and deliberate planning but remote from informed and timely input from the CIO. Whatever the case, it seems that this time is seldom marked by the measured pursuit of a new project in a way that melds interests of all potential stakeholders, the CIO among them. Consequently, the triumphant sense generated by victory is in many cases immediately replaced by a sober recognition that actually delivering what was promised will be extraordinarily difficult. Discussion of this syndrome was vigorous.

This outline is intended to supplement more detailed papers that emerged from the various breakout groups and discussions. These notes communicate some of the notions voiced, and the outcomes of debates focussed on identifying what is required to make the information asset a complete and relevant part of the construction life cycle, there being clear evidence that asset information loss at commission stage is a key driver of long-term operational under-performance. The result is an interesting reflection of the ideas and interests of those present.

The overall format of these notes are in the form of a series of topic areas introduced by a crystallizing assertion or question, together with some of the attendee reactions to each topic. Results are not perfectly parallel because they reflect the varying nature of the actual discussions, but many concrete points were elicited from those in the sessions.

Topic Area 1: Enhancing the Information Asset to Drive Operating Costs Down

Assertion:

"In order to maximise value from an asset that is being taken through Design, Build, and Operate phases, it is not sufficient to design a functional and constructible asset; it must be an effective fit over its total operational life."

It was felt that if the following points were followed or at least considered, overall life cycle cost will be reduced, quality enhanced, and the asset's purpose (typically to derive predictable

and forecast revenue to the owner operator) more completely achieved.

- Define your Operations & Maintenance (O&M) service strategy: Before moving to design, decide whether or not you plan to operate the asset yourself or engage a third party to do this. Knowing who is going to operate the system can provide insights into how, and reduce the chance of an operating requirement mis-match down the road. Obvious in hind sight, perhaps, but often overlooked until late in the game..
- Define your Asset strategy: Whether you plan to design, construct and sell, (a short-term interest horizon); to design, construct and exploit, (a medium-term interest horizon) or to design, construct and milk (a long term interest horizon), you need to define the life of the asset in concrete terms. This in turn leads to a definition of the information asset required, and ultimately to a definition of the optimum supporting systems in terms of your intended Asset strategy and time scale of interests.
- Involve your O&M party early on: Whether in-house or in the form of a third party, the skills of the O&M provider are different from the designer. Not just at the design stage, but potentially at

the tender stage, these skills need to be tapped. How can they provide a much needed influence on the scope of the design if they are not at the table?

- Define the information required to run the asset: In concert with the O&M party, decide what is needed to run the asset effectively and safely. Don't let the result drift into obscurity - include this definition in the Engineer Procure & Construct (EPC) tender. This is not a design definition, it is a requirements definition. In short it should not specify the system in which the data is to be captured, but should specify what data is required and what format it should take as an output. (A specific suggestion voiced on this point was BS15926.) In this way, the EPC contractor works using systems it is familiar with, whilst also providing a relevant and complete data set at the end.
- Define who will need to have views: A range of players will need to interact with the growing and final data set: Engage these people to define what they need to see, when, and in what way. Use this to create filters onto the full asset information volume. This can be achieved by finding out what questions will be asked that depend on the data.
- Invite EPC and O&M parties to the table together: Engaged in frank and constructive dialogue so that what is and is not known is voiced. Be open and honest about knowledge and experience gaps. Together, establish a complete map of information that is required by all parties (and their sub-consultants). With the information defined, make sure that the processes that link each party and information item have been defined and documented too.
- Develop the contract model to incite effective action: Outcomes without consequences are remote and meaningless to the designer. Outcomes need to be internalised by the designer if they are to be truly represented in the design process, and this implies a risk/reward link between the designer and the outcome. Lump sum is always preferred by EPCs, however they will gladly put fees at risk/reward where it is fair. Propose lump sum with a proportion at risk based upon (i) delivery of the information asset in addition to the physical asset and (ii) realisation of the operational savings defined in the design.

Topic Area 2: Factors influencing the EPC viewpoint

Assertion:

"The marketplace as a whole is forcing EPCs to take on more risk at reduced margins".

A variety of drivers that influence the EPC perspective were identified, and should be considered as EPC interests are developed during the project life cycle, particularly at the early stages of this process.

- Availability of talent: The number of quality resources is dropping (greying workforce and fewer graduates entering the Infrastructure business), and this is putting pressure on service providers. Complicating this is the fact that tenure of

staff in contractor firms averages 2-4 years meaning that few resources will see a project from start to finish and thus to learn from it. The result is a tendency to repeat what should have been lessons learned once, reducing profit and increasing risk. Mechanisms to deal with this problem are of keen interest to those involved.

- Globalisation: Clients and contractors now operate over a wider region than in the past. Expertise may no longer reside close to the client, which is not necessarily a negative factor but merely a complicating one. An EPC that can demonstrate access to a global resource pool (and focus it appropriately) has a competitive advantage. This stretches organisations to manage project teams in multiple locations where previously they were co-located. Coping with this is a current and future challenge and opportunity.
- Competition: Several years of tight markets and the introduction of skilled, lower-cost resources into the global marketplace have driven the bid price down. Clients now expect this, placing cost above proven quality in more cases. Also, new players have entered the marketplace from China, India and other places. A downward pricing spiral has profound implications in terms not only of marketing services, but of providing them.
- Increasing complexity: The projects tendered are increasingly complex, as process engineering continues to evolve and as design processes are increasingly enabled by sophisticated design tools. The client demands more as technologies (IT and Construction) are proven to allow previously unconstructable things to be designed, built and operated. This complicates every aspect of the design process and every element of the project downstream from that point, and is a pervasive source of EPC stress.

Topic Area 3: Thoughts on the KPMG Risk Management Survey 2006

Discussion also revolved around a Risk Management Survey made available by KPMG the year before. Several points were raised and discussed by attendees.

- Risk management can be a service offering differentiator: A point of discussion was to acknowledge that an EPC which can differentiate their offerings to help a client mitigate client risks will stand out from the crowd of competitors. The challenge is to (i) to align with client risk mitigation needs and (ii) to maintain that alignment.
- Transparency is an effective strategy: A client that is comfortable articulating its risks openly to its contractor (or potential contractors) is likely to get a better result through the alignment of the services proposed and what is actually required. Acknowledging risks can mitigate them.

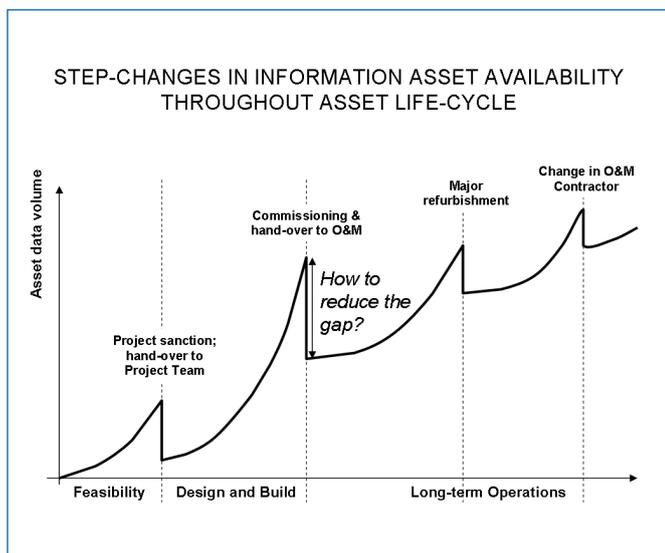
Topic Area 4: Information Management in the Owner/Operator

Assertion:

"At various stages through the life of the asset, significant data loss events occur. Addressing the causes of the information loss, will enhance the value of the asset through overall enhanced performance including reduced risk of unplanned outages and more efficient planned outages."

Andrew Marks, CIO, Tullow Oil, Plc., CIO Workshop 2007, Brussels, Belgium.

The owner operator perspective had some elements that were similar and some that diverged from the EPC preoccupations, and EPCs will do well to build



- Consider the asset life cycle from the start: Use a classification (e.g. BS15926) to define all data/information required throughout the asset's life so that things are not missed at an early stage when they are most easily captured.
- Define the business need for the asset: Determine whether the plan is to construct and sell-off, to construct and exploit for a few years only, or to construct and run to a natural end (+/- abandonment). The data requirement will depend on the route selected by the owner. It is tied to risk/value balance. For long-living assets, there will be feedback into (re)construct stage when major plant items are replaced or re-furbished. This feedback loop should be allowed for.
- Incorporate information metrics into the process: Measure completion of an asset build by the provision of information as well as by work done: it is impossible to create data if the plant item has not been designed, built, installed, commissioned, or maintained. The information asset is therefore the outcome of the work. Attendees contended that the contractor will have no issue providing information; they just need to be told what scope and what format.

- Acknowledge that technologies will change over time: Assess the impact of new technologies from a broad perspective. Current trends are returning to data-centric tools ("fill-in data fields to create an asset record"). These tools are independent of the contextual information critical to long-term successful running of an asset. They must be tied to context-centric tools such as document and drawing management systems. The trend towards discussion forums, blogs and use of email has created another dimension of information that needs to be captured and associated with the assets.
- Acknowledge the Owner Operator's role as a n asset guardian: The OO will be accountable for a period in the asset's life. Although this will drive the OO's need for that window of ownership and value creation, the value available will be impacted by prior guardians' efforts and will effect the future asset value.

Topic Area 5: Information Management in the EPC

Assertion:

"Bridging the gap between OO and EPC will drive value on all sides."

There were several areas where specific IM functions could bring more comprehensive strategic development into the process.

- OOs should force interoperability into the contract: The OO has the ability to define and require adherence to information standards. Add to that an incentive for the EPC to follow those standards, and more uniform operating approaches with the potential for longer term seamless functionality becomes much more likely.
- Adopt a global mindset: Since different parties will gain different value from complete asset data management, rather than carve out each unique data set, define the whole scope from the outset. An industry standard can be used to help with this. To build this into a 'real' outcome, provide role-based filters onto the data volume. The notion is that each party will see what they require, it will be up-to-date and integrated with the full picture of the asset.
 1. Owner's role: long-term, with value driven directly from revenue the asset delivers.
 2. Operator's role (may or may not be Owner): medium-term, with revenue typically driven by the rate paid by the owner, balanced by a contracted means to cover operating costs.
 3. EPC's role: one-off interventions to construct or to undertake major work on the asset.
- Have the CIO step up to the challenge as an enabler: The CIO has the ability to highlight the different viewpoints and to create the bridge once defined by the various parties; thus creating the opportunity for each party to derive its greatest value.

Topic Area 6: Mandating “Information Lifecycle Management”

Question:

“Can we identify ways to progress the bid and award process that mandates the use of information life cycle management and the business value available?”

Without a specific mandate and acknowledged role, information management will not progress smoothly through the life cycle. Providing a backbone life cycle mandate will preserve this function over the whole process in a more seamless way.

- Define the business model: Establish whether the purpose of information management is to drive value from the construction event itself (i.e. sell immediately) or to derive value over long-term operation. From this, define the information required at each stage and who should be responsible for it/who is best placed to capture it.
- Recognise that Information Life Cycle Management is a new concept: The concept of looking from idea to abandonment may be new. The principles of information management at each stage of asset life are not. Build from the latter with a recognition of the former.
- Get the CFO engaged: This is a discussion for the CFO, not the Project Manager since it is the CFO who will have an interest passed the delivery of a project on-time, on budget, and to agreed quality. Without that backing, the PM is not in a position to affect the course of events in this area.
- OOs should place ILM in the ITT and then the contract: Make the definition of ‘what and how’ a deliverable within the first month of the project. Monitor (and incentive/penalise) delivery against the agreed framework. Include in the post-project review.
- Employ realistic incentives: EPCs like lump sum contracts. They also like the opportunity to put fees at risk.
 1. Place some fees at risk based on the delivery of the information asset as defined.
 2. Place some fees at risk based upon the value identified as at risk as a result of good/poor information management.

Topic Area 7: Knowledge Management

Question:

“Can Knowledge Management still work, or is it an idea that has come and gone?”

Over the last several years there has been a growing realisation that knowledge management (KM) per se is never going to deliver the value hyped. In fact, several examples exist where the larger the investment, the lower the actual ‘knowledge value’ captured. Some ideas on how to respond to this promise unfulfilled were:

- KM alone can’t solve all the problems. KM will not address the experience leaving organisations through the greying workforce.

Further, KM alone is to some extent redundant and to that extent will not accelerate learning in young ‘millennials’ who have grown up in a world of the home PC, iPods and YouTube.com.

- Tighten governance (definition and monitoring) to do what is known to be the right thing: To capture relevant data/information at the time it is created and to document the rationale, context and learning throughout the project/asset life, rules of behaviour should be considered.
- Consider what an Expert is good at, and use that understanding to drive expertise:
- The group contended that experts identify patterns in the environment, data, or behaviours that lead to an expected conclusion. They also felt experts reduce risk by deducing likely wrong decisions, leaving a smaller number of opportunities with the highest likelihood of success.

The question then is how to drive that expertise, and a perspective on this is to drive expertise by prompting action. Empower junior staff so they can develop the required skills and can be trusted to do things on their own. A proposal is to provide different levels of guidance and to maximise the use of experts whilst they remain in the organisation:

1. Expert level: Capture the wrong answers. Provide lessons learned case studies. Show where changing actions, based on lessons learned, provided success.
2. Journeyman level: Provide guidelines that are in the form of a checklist of things to be considered. Allow the mid-level resource with room to innovate and react to the actual situation, however provide the constraints in terms of order, minimum actions, and example outputs.
3. Novice level: Provide detailed procedures that take the low-skilled resource through each step of low-risk tasks. Show the expected outcome and what would represent an incorrect outcome.

Each level provides a different degree of freedom to operate. The experts, who are few and far between, are kept for final decision-making, based on underlying efforts by Journeymen and Novices. These groups benefit by being the freedom to act, and seeing how their actions are assessed and used by the Experts.

As time goes by, the Journeymen see fewer interventions by the Experts and more frequently their ideas and recommendations being taken unchanged. The role of Expert becomes more of a mentor and guide; with effort placed on enhancing the guidelines and the procedures on the one hand, whilst making the critical decisions on the other.

Some Key Summary Points

The various points in this discussion were quite diverse and to some extent stand on their own, but a set of notions provides a useful overall summary based on function in the overall process:

Thoughts for the Owner Operator

1. Define the business model, and decide if you in it for the short-, medium-, or long-term.

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2. If for the medium- or long-term, what is your O&M strategy? In-house or third party?
 3. Engage the O&M party at the Design ITT stage ... and include their information needs in the tender.
 4. Thoughts for the EPC
 5. Listen out for the Owner Operator's Business Risks; align your solution and services to mitigate them ... and be ready to adjust to changing risks.
 6. Support the Owner Operator in defining its data requirements for the life of the asset, not just in the form of project documentation.
 7. Be comfortable using your preferred system, however be flexible to provide data and information in the format required by the Owner Operator and O&M teams. If they do not define it (or have difficulty defining it), help them to do it.

Thoughts for the 'knowledge worker'

1. We are all knowledge workers ... and the less formal knowledge management we do, the more likely we are to create an appropriate legacy.
2. Undertake your work as it should be done; with the intention to create a full and complete legacy of work done.
3. Be available to provide guidance and/or step-by-step direction for less-experienced staff.
4. Focus on identifying and capturing wrong answers and the patterns that predetermine likelihood of failures. The outcome will be true expertise to help increase the likelihood of success.

Authors: Andrew Marks, CIO, Tullow Oil, Plc. and A. Charles Rowney, Manager, ACR, LLC, CIO Workshop 2007, Brussels, Belgium

About the CIO Workshop:

The Event

Led by CIOs and professionally managed, the annual CIO Workshop is intimate and highly interactive. Experienced facilitators and a balanced agenda in a high end setting provide a focus and an effective platform for networking and discussion. Those invited to attend can expect concrete results and a stimulating event.

The Expert Advisory Panel

The Workshop is guided by a selected group of experienced CIOs. The Advisory Panel provides insight on the content, format and potential attendees. They also oversee the conduct of the workshop itself, in most cases personally facilitating breakout sessions and participating on panels.

For more information on the previous and upcoming CIO Workshops please visit www.cioworkshop.org.