

Mature Procurement of Large Scale Systems: A Better Way to Buy

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Abstract

This paper examines current procurement practices in the systems engineering industry, and identifies some underlying features of the system that sometimes make it fail. It will mainly focus on the structure of rewards within and between organisations, and will also touch briefly on the unrealistic treatment of requirement specification. Finally it will be argued that a more mature approach to procurement is needed, and describe some features that 'mature' organisations might be expected to have.

Performance metrics and fixed price contract bids have been central in the systems engineering industry for the past decade. These have provided some important management tools, but there can be a damaging downside to these practices. This paper will examine a characteristic of some metrics within companies, contractual arrangements between organisations, and procurement policies, that can result in the opposite outcome to the intended goal.

A further point will examine the unrealistic assumptions about requirement specifications made by current commercial practice. It will be suggested that large scale projects based upon such false premises are inevitably flawed from the outset, and that a more realistic approach is needed to achieve program plans that actually deliver a satisfactory product on time and within budget.

Finally, it will be suggested that the next generation of management and commercial policy should refine their current approach in order to take account of these factors. A possible means by which this might be achieved is outlined.

1. Introduction

Throughout the 1980s and 1990s, in the shadow of the success stories of the Far East, the private and public sectors in the UK have made great efforts to improve the efficiency of their businesses. The defence sector has moved towards competitive and fixed price contracting, modular builds, and subcontracting out large amounts of work. Contracts have acquired harder, more defined edges. Metrics were introduced to measure corporate and individual success, and objectives were set to ensure continuous improvement. Industry was flooded with management consultants who gathered us around flip charts and told us: 'if you can't measure it, you can't manage it'.

Theoretically, we have achieved this effective, streamlined system where we know our goals and monitor our progress towards them. We specify our requirements, invite competitive tender to find the lowest bidder who can meet that specification, then form a black and white contractual agreement that ensures it shall be done. Why, then, does it seem that our projects can still run over time and over budget, integrated systems fail to integrate, and users complain bitterly that the product is not what they wanted?

One of the reasons why this may occur is that the measures that we have devised to keep track of our contractors and our employees activities can actually provide direct motivation for them to work against the customers interests. If we are to develop into a successful technical community, we have to adapt our management and commercial policies so that we encourage both individuals and companies to contribute to the greater good. Major technical projects are quite difficult enough without half the team members being systematically rewarded for pulling in the wrong direction.

Where this applies to performance metrics within the organisation, it has been described as 'dis-organisation' (Courteney 1996) because it systematically works to achieve the opposite of the organisations goals. This can occur when the metric measures a quantity that is easy to measure, rather than the feature of performance that is

really important. In these cases, individuals may actually divert effort away from the activities that really contribute to company objectives, in favour of activities that will boost their apparent performance as presented through their performance metrics.

A similar effect that occurs between separate organisations, due to the nature of commercial policies, is described as 'dis-integration' (Courtney 1996) because it results in the opposite of successful integration between the organisations involved. Some features of commercial practice seem to make it inevitable that projects will be late, overspent, and unsatisfactory to the user. This is not because the system producer is incompetent, complacent, or wilfully dishonest. It is because the procurement policies that were devised to obtain the best buy for the customer have, unwittingly, forced suppliers to provide a less than ideal response.

A second issue is that initial requirement specifications are not tablets of stone. For any large, technically complex project that requires developments into uncharted territory, the exact specification of what is required is probably not fully known at the outset. Even where it is known, the terms in the specification are often subject to interpretation. Almost everyone in the industry knows that this is true. Yet, the industry as a whole seems determined to continue doing business as if the requirement specifications produced at the beginning of a major project were reliably certain, unambiguous and relatively complete; that they accurately accounted for interfaces to other systems, and embodied a valid representation of what the end user will want.

Therefore, there are at least two fundamental issues to be addressed in a more mature procurement system:

- the system of rewards must be reviewed to favour good service and a satisfactory end product.
- the contractual arrangements surrounding the requirement specification of must be approached with less optimism and more realism.

2. The System of Rewards

Measuromania, Subcontractitis:- and the Worship of Bar Graphs

Over the last decade, many organisations have been dominated by the need to understand the details of their own performance in financial terms, and improve it. The popular slogan 'If you can't measure it you can't manage it' sounds so obviously reasonable that it is rarely challenged. The organisation must either measure everything or nothing, or a very carefully selected number of things, because parameters that are measured inevitably take on a significance above anything that is not. A fundamental problem with measures is that they are, by their nature, based on numbers. Unfortunately, the real aims of our endeavours are often quite difficult to measure in a quantifiable, numerical form. The depth of an investigation, the effectiveness of a presentation, the usefulness of our advice, cannot be neatly quantified and made into a graph for the end of month report. So, instead of measuring what is really important, we choose a parameter that is easier to quantify: the time to complete each investigation, the cost of each presentation, the number of clients given advice.

If the organisation decides to use these measures as indicators of merit among the various departments and individuals, then these newly measured criteria will become the primary goals of the individuals conducting the task at the working level, and their supervisory management. When an individual has to decide whether to push a job out of the door in a barely acceptable state, or whether to spend a little more time to make it better or more useful to its user, the new criteria will strongly favour the former. Rewards are gained by doing the minimum possible to meet the letter of the requirements, and for meeting self imposed delivery dates; whether or not the product works well in service becomes of secondary importance.

Identification of issues that will cause problems downstream, for example, will only multiply costs and delays and black marks for the project team. The successful careerist will ignore such time bombs, turn his project in on time and, on the basis of his excellent performance, be promoted to another job before the problem comes home to roost.

The criteria that are easily measured, and therefore take precedence, are often directly opposed to the criteria that really matter. The traditional trade-off between quality and quantity seems to have been overlooked as we measure quantity in the hope that quality will improve as a consequence. After all, graphs have been produced to

show that things are getting better. (It could also be said that the effort involved in producing such graphs can be a questionable use of peoples time).

The close relative of 'Measuromania' is 'Subcontractitis': the current tendency to subcontract out every possible function. This helps achieve what every Purchasing Manager is measured against, the reductions he can make in his supplier base, which he can be expected to make fairly rapidly. Other more complex considerations can become secondary such as:

- How can it be ensured that all the constituent part of a system come together and operate as a whole? This cannot be guaranteed no matter how good the individual specifications are. Complex systems are difficult to predict or specify in quantitative, unambiguous terms. What will happen when each sub-contractor has met the letter of his contract but the system as a whole does not work?
- How will he avoid all the well-known problems associated with single or reduced sourcing such as high prices and a high risk to the overall programme associated with the late delivery of parts?

The outcome is that the management sees the company performance efficiency appearing to improve, and is then devastated to find that they run into severe difficulties due to unforeseen and unexpected crises. These crises have been created by the neglect of the real priorities of their business but, since they have systematically punished their employees for diverting their time and money to such 'unmeasurable' considerations, they may find themselves with a folder full of impressive looking graphs indicating success, and a failed business enterprise.

The 'witch -hunt' that follows will involve some spectacularly skilful back covering and reciprocal finger pointing, but it won't help; ultimately no clear liability will be proved. Success will, once again, have slipped through the net and no-one will really understand why. If a scapegoat can be found and one or more parties are blamed for the failure, this is often regarded as satisfactory closure: it was so-and-so's fault. Unfortunately, this is far from satisfactory, because it does not reduce the likelihood that we will fail again next time. What is really needed is reliable success in large integrated system projects - and it isn't happening yet.

3. Examples of 'Dis-Organisation'

Here are some common examples of how attempts to control internal business can be self-defeating. All of these measures are based on the assumption that an individuals judgement about whether an item is or is not 'necessary' or 'important' is completely independent of their own vested interests. This is not entirely true; the effect may even be subtle and not entirely conscious, but vested interest can influence 'judgement' quite considerably.

- Budget allocations that are based on the previous years spend are intended to avoid wasting company money; BUT it encourages wasting money on the needless purchase of unwanted items at the end of the financial year, to avoid having a reduced budget next year - when it might actually be needed for unforeseen expenses.
- Activity measures are intended to promote efficiency by providing some measure of how busy and productive staff are BUT it takes no account of how necessary or useful these activities may be. This may result in reduced efficiency with more meetings being held, or documents being written, than are actually necessary or useful. Meanwhile, effort is diverted away from the real task at hand.
- Change requests (CRs) are sometimes counted as a visible measure of whether the design team has got it 'right first time'; BUT if it is decided by the same team that produced the original work they may not wish to raise changes that would, in fact, be beneficial, because it reflects badly on their initial work. Alternatively, if it is the task of the production or implementation team to raise the CRs, they may be tempted to raise more than are actually necessary, in order to create a 'smoke screen' that can camouflage their own schedule delays by blaming design.
- Program milestones: during the transition between one phase of a programme and another (for example, the development and production phases), priority may be placed on completing the remaining development tasks in order that the company may claim milestone payments and then concentrate on production (and the improved cash flow that may result). If this is done without due regard to the quality and completeness of the development programme, then time consuming and costly development issues may have to be resolved during the production phase. Similarly, if a customer completes the specification of the product they require, in good time but at the expense of a reasonable review period, the contract may be signed on time but the expensive and disruptive contract changes further downstream are not a consideration (and are often somebody else's problem). These factors do not simply delay the problem - it will be much more difficult and expensive to resolve it later in the program.

- Event reports of systems in service can be subject to all kinds of vested interests, depending on who will be seen as 'to blame' and who will pay the price of corrective activity. In order for the system to evolve to optimal usefulness, and for safety related events to be noted and prevented from recurring (possibly in a chain of events leading to an accident next time) they must be minimised, reported and investigated for root cause.
 - Minimised: System designers may or may not want to receive event reports, depending on where the responsibility for, and cost of, rectification will fall. If it is covered by a lucrative 'maintenance' contract then they may welcome as many events in service as possible, and might even have created the system in such a way that this would be sure to occur, keeping the team in work for years after delivery. This would also allow an early delivery date with a minimum of design effort and testing. Maintenance staff may even discover that they can apply temporary fixes that will require repeated calls and show them to be busy, indispensable, and quick to 'diagnose' the problem. If the maintenance call is 'closed' and reopened as a slightly different problem during the maintenance activity, it is a sure sign that maintenance staff are working to a time related metric per logged call.
 - Reported: If events in service can in some way reflect on the users - and their metrics - they may be reticent to report them. Manufacturers may not encourage reporting because if they are shown to be aware of an issue but have not yet rectified it, their liability for any accident involving that issue is increased considerably. Given that no company can rectify every reported issue immediately, this is a powerful disincentive to collecting information that could aid system improvements.
 - Investigated: Investigators also have their own metrics and motivations. A common metric might be 'time taken to complete each investigation' thereby encouraging the investigation to be as brief - and therefore superficial - as possible.
- Other Maintenance Services: Many companies that operate equipment or machinery, whether aircraft, building plant, or motor vehicles, also offer a maintenance service to its own, and other, operations. This is likely to be a separate cost centre and responsible for its own profit. Its internal budgetary procedures may, for example, charge less for parts or services to its own company equipment, than when the same parts or services are supplied to equipment from other operators. This would seem to make sense because it favours their own operations, giving them maintenance at a lower cost. Unfortunately, the performance of the maintenance managers are often judged on the criteria of how much money they make on their budgets. They may now be tempted to divert parts and available service personnel away from their own company's equipment in favour of tasks from other companies. If he gives priority to the maintenance tasks of a competitor, he will sell his available parts and services for a higher price, and improve the maintenance account figures. The company's own machines are then left unserviceable while their competitors are given preference and return to service first. This, too, may be desirable to an unscrupulous maintenance manager, knowing that the company's competitors could choose to buy their maintenance services elsewhere in future, but their own operators cannot.
- Raising Problems: Managers in some companies are discouraged from raising program difficulties with their superiors, because the problem that they raise will be seen as reflecting badly upon themselves. This can lead to individuals or department heads handing over their 'internal product' in a form that appears to the untrained eye to be acceptable and only they - the subject experts - will know that it is not.

4. Examples of 'Dis - Integration'

Similar characteristics to the 'dis-organisation' that occurs within a company can be mirrored by the contractual arrangements between different organisations involved in a particular project or across a whole industry. This is known as 'dis-integration'. Organisations contractually reward each other for producing the very thing that they did not want - unrealistic bid prices, glossing over of problems at the early stages that will emerge (at higher cost) later on, expensive and unavoidable maintenance burdens. This is probably best illustrated by offering some typical examples:

System Procurement

The customer, particularly in highly competitive markets where his position is strong, will sometimes issue what are actually impossible requirements, especially with regard to programme timescales. Bidders will know that if a product takes an absolute minimum of 9 months to manufacture and not 6 as the customer's requirement demands, then he must not admit this in his bid for fear of losing out to a less honest competitor. Compared to losing the business, suffering some penalties for late delivery further down the line is probably a favourable trade-off.

Competitions run along these lines do not encourage realism or long-termism. Problems are stored up until they have real impact on commissioning and in-service dates. There is even less room left to take consideration of the types of unforeseen events that can take place during complex development programmes. A programme may look watertight in black and white, but this can mask the reality of such projects, especially when all contingency has been stripped out and an open approach to risk management has not been encouraged.

Software

Imagine that you are the manager of a software house. You are going to tender for a certain job, and have to decide what your policy will be: 'Right First Time (RFT)' or 'Minimum Acceptable Delivery (MAD)' standard. RFT will give the customer what they really want at first delivery. MAD will give them a system that meets the bare letter of their contractual specification, but probably won't work as they want it to work. What trade-offs would you make? (Table reproduced from Courteney 1996.)

Right First Time (RFT)	Minimum Acceptable Delivery (MAD)
Higher bid price (to allow for full validation)	Lower bid price (more likely to win contract)
Later delivery dates (to allow for full validation)	Early delivery dates (more likely to win contract)
No follow-on contracts for 'maintenance', debugging, improvements or upgrades	Lucrative maintenance and improvement contracts almost a foregone conclusion
All project staff jobless after product delivery	Skilled staff continue with only gradual reduction
Excellent documentation; others could fix or develop the system without you	Sparse documentation; all future system developments / maintenance must be done by you

The 'Right First Time', perfect product begins to look like a financial liability to the contractor. Few software houses could afford to lose the 'maintenance' contracts to debug their products in service, or their follow on projects to improve functionality or user friendliness. They know that the customers of large scale commissioned software cannot afford the costs or delays involved in changing suppliers and starting again from scratch. If their products were really 'right first time', they would lose competitively bid contracts, reduce profit margins on those projects that they did have, and could risk being pushed out of business.

Assessments and Audits

Other professionals, ranging from ISO 9001 auditors and procurement agents to policemen, tax inspectors, and benefit fraud investigators, are actually paid specifically to identify faults and misdoings of other people. If their competence is to be judged by their ability to find such misdeeds, they may decide to pounce upon every apparently trivial, but technically incorrect, deviation from the letter of the law. They are probably not really so petty minded as to believe that these things matter, but they are easy to find and demonstrate that the task of 'fault finding' has, in some measure, been done. Any investigator can almost certainly find some minor transgression among the obvious and factual details of a situation. Identifying and 'proving' a real gap in the processes of a newly encountered company in an unfamiliar and complex industry is a daunting task. If it doesn't work, it will have absorbed all of the available time so that the auditor goes away having identified no flaws at all; Company 10, Auditor Nil. The rewards will favour those who disregard the search for 'real' issues in favour of easy, superficial targets. At an internal level, persons whose task it is to identify deficiencies may not be motivated to 'find' very many of them if the result is extra work for themselves, black marks for their colleagues, delays, or costs on their budgets.

Self Preservation

There is a danger, when jobs are at risk, that employees feel compelled to 'justify their existence'. An agency working as a watchdog on behalf of consumers may feel no compulsion to work with the supplier base to improve overall performance. After all, the industry is and always will be inefficient and so they, the agency, are needed here to stand over them until they get it right. In a perfect world where everyone really *did* get it right, there would suddenly be large numbers of agency people who would become surplus to requirements. Those people may not see this as a particularly desirable goal.

5. Contractual Realism

It is well known to anyone who has ever worked on a complex project involving new technical developments, that the whole task requirements, demands and timescales, cannot be accurately predicted from Day One. There will be needs and complications that become apparent during the program, tasks that have been forgotten or were never thought about, changes in the context in which the system must function, new technologies that don't work either separately or together, user feedback on proposed solutions that require additional program time to incorporate. The effect can be mitigated by the redistribution of program resources to put a far greater effort into the specification of requirements, and the early reduction of uncertainty, before design work begins. Programmes may benefit if there were more recognition that passing requirement specifications from one stage to the next will need more thorough liaison than passing a complex document 'over the wall' to the next department or contractor. These would both be worthwhile changes, but it seems unlikely that requirement changes can ever be reduced sufficiently to make a 'fixed' arrangement into a viable proposition.

Successful procurement programs in the future will need to recognise these features of large scale contractual relationships and accommodate them within the formal arrangements for the task. This will be difficult and needs some imaginative planning. Possibilities could include multi - stage development programs where the requirement for each 'next stage' is renegotiated in the light of progress to date, although this has the potential to be abused if unscrupulous contractors realise that a customer has gone beyond the point of no return. Some kind of fixed quantity 'change fund' might be less vulnerable, where specific funding and program time are set aside for customer change requests (up to the set resource level) at planned stages. Risk sharing, employee profit sharing schemes, qualitative measures, excellent program monitoring and other laterally thought out alternatives need to be considered if the technical community is to find a way of working that is genuinely fair, motivating, and successful in both technical and financial terms.

6. Organisational Maturity

In order for dis-integration and dis-organisation to flourish there are a number of common elements that need to be present in an organisation; these elements cannot exist in an integrated, organised, 'mature' environment. What differences would characterise current commercial procurement practices as compared to the envisaged 'mature' procurement system?

Organisational Culture: Mechanistic Vs. Organic

Firstly, the management must be stricken with 'measuromania'. Current practice is mechanistic, assumes that human judgement has rigid, stable criteria, although we all know that the answer to the question 'is this necessary?' can be influenced by vested interests. It separates internal cost centres to 'sink or swim' on their own budgetary accounts, compartmentalises responsibility and sets departments against each other instead of the real task. It measures simplistic, low level performance indicators that encourage us to take our eyes away from the real issues, never get close to the wider picture and are unintelligent. They will look at the very lowest common denominator: How fast? How many? How often? How late? The reaction may then be equally simplistic – faster, more, less. They will ignore complexities, inconsistencies, trade-offs, human nature. Finally, they are used to blame or reward – and there we have the perfect final ingredient, something which injects emotion and the need for subjectivity. However, this approach suffocates the very assets that have traditionally raised human beings above machines: their ability to be flexible, adaptable, and creative in working around problems; to prioritise and make complex judgements based on a wider view with multiple information sources in a variety of formats and weightings; to use qualitative as well as quantitative information, and to change the plan in the light of changing circumstances. A mature, 'organic' culture would foster the advantages of human capability, and raise measures of success to a higher, more overall level.

Time Horizons: Short Vs. Long Term

Current practice emphasises short term goals and (at least the illusion of) rapid progress at the early stages of a project. They look at the 'now' of the business, and not the possible longer term effects of timescale or cost downstream. They reward and promote those who have taken the short term fix, who will have moved on before the consequent problems arise. Mature organisations have longer time horizons and accept short term program deviations for the greater good of the overall program schedule.

Employee Motivation: Opposition Vs. Alignment

Current practice assumes that the simplistic measures that are in place are directly related to Real Value Added and that employees are motivated to meet the measures. The latter is probably true - they are indeed motivated to meet the measures - but if the measures are unrelated or even opposed to the Real Value, employees motivation to meet the measures is actually detracting from the job at hand. Worse, professional people become frustrated and demoralised if they feel that they have to make a trade-off between doing what they know is right for the job, and doing what is rewarded by the organisation. Of course people still need to be held accountable for their performance, but if this is done without any regard to the long term impact on the wider business, then it will only encourage manipulation of measures for individual reward. In a mature organisation, rewards are aligned with Real Value Added, benefiting both the job and employee morale.

Realism: Tough Optimism Vs. Real World Pragmatism

The 1980's saw the rise of the viewpoint that if a certain target appears on someone's contract or annual objectives then it will necessarily happen as required; otherwise, the perpetrator would be penalised or even replaced. This could be called 'tough optimism'. Unfortunately, threatening to beat people with a big stick if they couldn't fit a quart into a pint pot didn't work then, and it won't work now. Mature organisations allow a realistic view of resource estimates, progress and contingency, and the need to supplement written requirements with genuine dialogue and ongoing discussion. Employees would hopefully become 'aligned' in their motivations, and use resources efficiently and honestly. Mature procurement agencies must become sufficiently realistic to acknowledge that forcing contractors to produce low cost estimates does not necessarily result in the product that they wanted, arriving on time and without them having to part with a lot more money in the end. They must provide highly skilled monitoring, and remain in touch with the development process, so that they know whether real unforeseen complexities have arisen, or whether the contractor is actually providing a substandard service.

Perspective: What is Measurable in Numbers Vs. What is Important and How Should it be Assessed?

There is a difference in emphasis between these two approaches. The current practice is often a case of identifying factors within a job that can be easily and numerically measured and then making these the number one priority. Unfortunately, these measures cannot reflect complex or subjective situations e.g. how satisfied is your customer? What is the total cost of ownership? A mature organisation first decides what is important, and then finds the most appropriate way to assess it, whether by numerical measure, verbal justification and skilled oversight, or new and yet undiscovered means of evaluation.

Rewards: Quick Fix Fire-fighters Vs. Durable Achievement

The key to mature organisations and their contractual relationships is to reward the attitudes that are beneficial to the business and not the attitudes that ultimately lead to failure. Current practice rewards those who produce a quick fix to a crisis, but tends to disregard those who have planned and prepared their work well and achieved it with minimum fuss and risk. We assume that the task cannot have been all that difficult since it didn't cause any internal publicity, crisis points or dramas. This is inevitable until we can provide supervision and oversight that has deep understanding of the work being done, and have confidence that we can trust our employees to be doing their best for the company. In a mature organisation, crises are seen as less than glamorous and steady results are acknowledged.

Application in Service: Worked as per the Spec. Vs. Worked as the User Wanted it To

The current business culture is to defend products that work as per the specification and disregard user dissatisfaction in service as 'not our problem'. This is largely as a result of spending too little time on the specification and making no program provision for iterative user involvement. As a result, 70% plus of safety problems with complex systems are attributed to 'user error'. A mature organisation with mature customers plans user involvement into the program - and into the estimates.

7. Mature Procurement

In the procurement environment there are always two or more organisations involved. What maturity characteristics specifically apply to the procurement process?

Primarily, the procurement organisation must cease to propagate 'dis-integration'. That is, it must cease to reward contractors for doing the opposite of what it wants them to do.

If it wants realistic time and cost estimates that will be adhered to, it must stop rewarding the contractors that give the most unrealistic estimates by awarding them contracts. They should instead select their contractors by fostering a meaningful relationship with the candidate companies, qualitative examination of their expertise and reviewing their track record with other large contracts. Organisations engaged in mature procurement would be willing to invest much more time during the early stages of the project to refine the requirements and incorporate consultation with relevant parties such as users, and those responsible for the development of other systems that will interact with the product in question. By investing time in this way in the early stages of a project, large amounts of contract change could be avoided, post-implementation problems would be reduced, and the total cost of ownership would fall dramatically. A constant flow of contract change will delay programmes, introduce more risk, and will increase costs and uncertainty, especially where the parties are working in an adversarial relationship.

For the development and production of complex systems, mature organisations should recognise that even though much time may have been invested in agreeing a set of requirements, a contract cannot possibly detail every single requirement and in an 'interpretation-proof' way. There will always be nuances, different ways of reading requirements and unforeseen circumstances. If the parties do not recognise this at the outset and devise mature ways of resolving such situations before they arise then much time will be lost in 'specmanship' and the sensible and logical approach will not always be in the best interests of either. A customer can find that he has to put his hand in his pocket each time that a requirement is contested, particularly if the supplier felt forced to agree to unrealistic requirements initially.

A mature procurement organisation would abandon the outdated 'them and us' mentality, especially where the 'them' doesn't really understand what the 'us' does for a living. (Happily this is a mindset that seems already to be fading from industrial relations within organisations.) Instead, they must form long term project teams that include representatives from all parties. Such teams would grow to understand the product in depth and follow it through its various lifecycle stages, people who can look across the whole business and understand more than the processes in their own back yard, who can remember why certain decisions were reached two years earlier. They would endeavour to understand the issues and generate workable solutions.

8. Conclusion

A mature organisation is one that plans realistically, is open and honest with its suppliers and customers, is brave enough to accept its employees reporting negative results and to see these in the wider context. It works across boundaries and encourages its employees to do the same, is focused towards the long term and is not geared towards fire-fighting. A mature organisation has a considered approach to the relative importance of quality, time and cost, encourages improvements in efficiency and finds ways to implement these improvements even if they go across cost centres.

Mature procurement seeks to minimise total cost of ownership, and takes a realistic approach to achieving it. It is time to recognise that current procurement practices are not working well, and that the villains are not the players, but the game. Basic human psychology is to behave in the way that brings us rewards, and a system that rewards the opposite of its goals is doomed, from the outset, to fail. It is also an unsatisfying and demoralising situation in which to work. Better procurement practices may eventually produce the 'holy grail' of large scale system projects: the mythical 'win-win' situation where the customer, the contractor, the employees, and the users, all come away satisfied at project completion.

9. References

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