What is of value to your customer: a study of the application of the customer's value criteria tool

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BIOGRAPHY

John Kelly, AWG Professor of Construction Innovation, Glasgow Caledonian University and Steven Male, Balfour Beatty Professor of Building Engineering and Construction Management, University of Leeds, have worked extensively with client and construction industry supply chain members. They have jointly researched, developed, benchmarked and implemented a value management methodology for the UK construction industry described in "The Value Management Benchmark" published by Thomas Telford. John and Steven follow their first UK book on value management, published in 1993 with a new book, "Value Management of Construction Projects" published by Blackwell in February 2004. This book, written in conjunction with a practitioner Drummond Graham, consolidates 10 years of research and consultancy into a practical text.

Steven and John have facilitated a number of value-for-money studies for a variety of construction clients and contracting organisations. Themes within these action research consultancy studies have included: value management and value engineering studies with a range of Blue Chip and Government clients, studies for clients with major refurbishment programmes, studies for clients wishing to develop long term partnering and supply chain arrangements, studies for construction industry consortia or clients involved in PFI Pathfinder and Prime Contracting projects.

ABSTRACT

This paper describes research work continuing from that reported at the Denver conference (2002) that proposed a methodology to make explicit the client's value system. An argument was presented that value could not be managed from the client's perspective unless it could be disaggregated into those component non-correlated issues associated with the value concept. Following a detailed literature review a paired comparison model was presented. The paired comparison model has been used in a number of workshops. This paper presents a critique of the use of the model and improvements in the model brought about through practical application. The paper concludes with a critical theoretical appraisal of the model in the context of philosophical debate of axiology (value theory).

INTRODUCTION

Kelly and Male (2004) define value management as "the process by which the functional benefits of a project are made explicit and appraised consistent with a value system determined by the client". A number of arguments have been made for the importance of understanding the component parts of the client's value system in order to manage value. This paper is divided into four sections; first a review of the Denver paper and the client's value system model proposed two years ago; second a report of the use of the model in practice and the reason why improvements were considered necessary; third a critical theoretical appraisal of the model in the context of the philosophical debate of axiology (value theory) and finally conclusions and recommendations for the next stage in the use of the model.

PART 1 – A REVIEW OF THE DENVER PAPER

In traditional construction project programming/briefing the client value system becomes established through a process of trial and error on the part of the designers. It evolves slowly over time as the design team present and re-present schemes that reflect their current understanding of the client's value system. With each iteration the designers take one step closer to full understanding. However, the newer procurement systems are not sympathetic to this slow iterative process. It is proposed here that the client's value system is made overt in a single operation through a process of discovery using the value management techniques described.

For the client's values system to be meaningful the variables of time, cost, quality must be capable of description and measurement. To this end a number of action research projects were conducted through value management workshops. The key to making the client's value system overt and therefore auditable lay in understanding the description of quality, a concept which value management teams found confusing. To derive a measurable statement of quality, quality itself needed surrogates which are measurable. It was determined that quality could be represented by; Environment, Exchange, Politics/Community/Popularity, Esteem and Comfort each of which have their own continuum. The full client value system described in the Denver paper (Kelly and Male: 2002) is as follows:

- Time: the time from the present until the completion of the project, the point when the project ends and is absorbed back into the core client business. Time can be assessed on a continuum from time is "of the essence" to time is "at large". Of the essence means that were the project to be delivered one day late then it would be of no value. For example, our satellite has just missed the shuttle launch.

- Capital cost (CAPEX): all costs associated with the capital costs of the project, measured on a continuum between the budget we have is tight to we have flexibility in budgeting.

- Operating cost (OPEX): all costs associated with the operations and maintenance implications of the completed project within the client's core business. In the context of a building this includes facilities management which may be limited to maintenance, repairs, utilities, cleaning, insurance, caretaker and security, but may be expanded to include the full operational backup

such as catering, IT provision, photocopying, mail handling and other office services. The continuum is between a controlled absolute minimum to flexibility in operating cost.

- Environment: the extent to which the project results in a sympathetic approach to the environment measured by its local and global impact, its embodied energy, the energy consumed through use and other "green" issues. The continuum is between maximum observance of Kyoto and Agenda 21 to solving every problem by adding more power.

- Exchange or resale: the monetary value of the project. This may be viewed as assets on the balance sheet, the increase in share value or in the case of a building for how much could it be leased or how much would it realise were it to be sold. The continuum is between maximum return to return is of no importance.

- Esteem: the extent to which the client wishes to commit resources for an aesthetic statement or portray the esteem of the organisation, internally and externally. The continuum is between we need to attract the admiration of the world to esteem is of no significance.

- Comfort: the physical and psychological comfort of the building as a place for working and living will impact human performance. Comfort is measured on a continuum from the support of the business in purely utilitarian terms or a high degree of opulence.

- Politics: the extent to which community, popularity and good neighbour issues are important to the client. The continuum ranges from must be popular with our local community or electorate to we have no concerns towards our neighbours.

Two exercises are carried out to tease out the client's values, a continuum survey and a paired value comparison. For the continuum a voting sheet is passed to each client member of the team for them to enter on the continuum their personal value in respect of the eight variables. The sheets are then collated. An example of the comfort continuum with aggregated voting is shown in Figure 1.

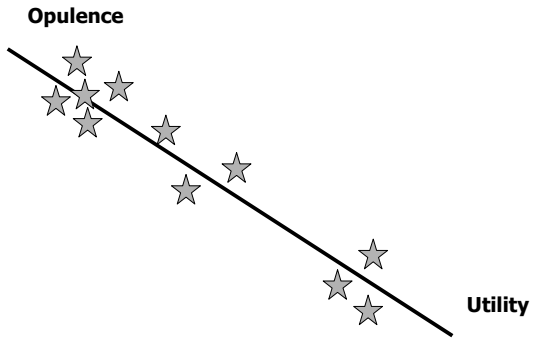

Figure 1 – The Comfort Continuum

A paired comparison, using the matrix below, is undertaken with the workshop teams. Each box represents a question phrased "which is more important to you ……?" or "would you be prepared to sacrifice……". Either way the letter inserted in the box represents whichever factor is the more important. For example, the question may be posed – "are you prepared to spend more now to offset costs in the future?". If the answer is "yes I am prepared to spend more now to offset future costs", then obviously future costs are more important to you than capital costs and therefore the letter B is entered in the box. Conversely if the answer is "no I must stay with the present budget even if it costs me more later", then future costs are less important to you than capital costs and therefore the letter A is entered in the box.

The number of times that A appears is entered in the total box and likewise for all of the other headings. The individual units of the value system can therefore be ranked to represents the overall client's value system.

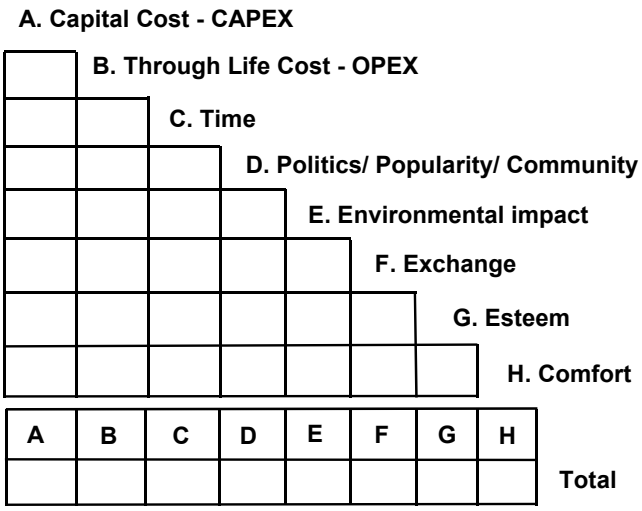

Figure 2 – The Denver Model

PART 2 – USE OF THE MODEL IN PRACTICE

It was argued in the Denver paper that as value was a function of time, cost and quality then from the model it could be seen that quality could be represented by, Environment, Exchange, Politics/Popularity/Community, Esteem and Comfort each of which have their own continuum. While it was predictable that there would be a range of perceptions of quality by individuals within the team the extent of the difference was not anticipated. Analysis within the past two years confirms that quality is a construct of comparability in which each person's perception occupies a place on the continuum based upon their experience and/or knowledge of the concept under review. For example one person's view of opulence might be another person's view of normality. This raised three problems in practice:

1. In collating the team's voting slips onto a single continuum there was no guarantee that the individual votes were in the same position relative to each other for the reason of the personal construct comparability theory illustrated above.
2. Initially, all stakeholders were allowed to take part in the exercise. This posed two problems, firstly that the value system became that of the stakeholder team and not the client and secondly that wide discrepancies between the client representatives and the design team were made uncomfortably overt.
3. In undertaking the continuum exercise immediately before the paired comparison exercise it was difficult to persuade team members that the two were in fact entirely separate. Team members saw the up end of the continuum scale indicating importance and transferred that thinking to the paired comparison, distorting the full value system.

These problems have been unsatisfactorily addressed by discontinuing the use of the continuum voting and also by allowing only client stakeholders to take part in the paired comparison exercise. It is accepted that this is "ducking the issue" but as yet no satisfactory method has been found to incorporate the continuums even although the discussion that accompanied their completion was valuable.

The use of the paired comparison model has been very successful in terms of its efficiency in use, the quality of the information obtained and the client acceptance that this is in fact a true reflection of their value system. However, the action research undertaken has led to a number of improvements to the model and its method of use. This section reviews each facet of the model in turn.

1. **Facet A Capital Cost (CAPEX)** - The concept of capital cost was well understood by all team members. However in practice it was found that public sector and private sector clients made different interpretations. Private sector clients tended to have a relatively flexible interpretation of capital cost budgets particularly when paired with the facets of through life cost, time and exchange. A private sector client was much more likely to rank time ahead of capital cost therefore indicating a willingness to spend more to save time. This was not however replicated in studies with some private sector clients and the majority of public sector clients who operated within fixed budgets. It was sometimes difficult for these clients to see anything as being more important when paired against capital cost.

   Realising this as a problem it became necessary to ascertain at the outset whether the budget was to remain fixed or whether the budget had an element of flexibility. If the client had a fixed budget then it was necessary to debate whether the capital cost facet should be substituted by the facet space.

   In a VM study environment a short instructive story was told to illustrate this aspect. The client was asked to imagine that they were in the market for a new SUV and that they had a budget of around $38,000. For that sum of money it is currently possible to purchase a 9-seat 4x2 SUV with the 6.8 litre engine but with a limited specification typified by a radio with single CD player. For the same sum of money it would be possible to buy a slightly smaller 9-seat, 5.4 litre, 4x4 but with very little luggage space and, relative to the previous

model, fairly cramped third row seats. However, the specification would be considerably increased. Finally also for the same $38,000 it would be possible to purchase a yet smaller 7-seat, 4x4 with a 4.6 litre engine with a very high level of equipment. The question was then asked of the client are you willing to compromise on the number of square metres of floor area in the building to obtain an increase in other value attributes. Approaching the capital cost heading on this basis has proved to very successful.

2. **Facet B Through Life Costs (OPEX) -** Most clients understand the concept of through life costs and this heading has proved to be a problem only for those clients considering the procurement of projects on a design, build, finance, operate basis (DBFO). In a DBFO situation the capital cost is reverted to a through life costs therefore facet A , capital cost can be deleted entirely.

3. **Facet C Time -** The facet "time" has not proved problematic in interpretation provided that it is explained that the facet "time" means time from the present until the handover of the project to the client organisation, i.e. the absorption of the project into the client's core business.

4. **Facet D Politics/Popularity/Community -** This facet has not proved problematic provided that it is emphasised that "community" relates to the local community and that "politics" relates to local politics. This facet addresses the extent to which the client is willing to compromise on other facets to ensure that the whole project sits well within its local community.

5. **Facet E Environmental Impact –** This facet has sometimes required a debate to ensure that the proposed project sits concurrent with the corporate policies of the client organisation and particularly the extent to which these exceed the legislated minimum.

6. **Facet F Exchange -** The only issue arising with the concept of "exchange" has been in the context of public sector projects that tend not to have any requirement for exchange. In this situation it could be argued that exchange facet can be deleted. This would be a mistake in that the potential for exchange against all other facets would be removed. It is better to allow the exchange facet to remain and allow it to be scored at zero.

7. **Facet G Esteem -** Esteem has to be clearly explained as that element of design that seeks to portray the organisation in a global context. Therefore, esteem is relevant to the outside rather than the inside and is often expressed through the building's architectural aesthetic and/or freestanding art or sculpture.

8. **Facet H Comfort –** This facet was named "Utility" in early studies which proved a difficult concept to describe. Next came "Fitness for Purpose" which was always scored as the most important aspect for the reason that the project had to be fit for purpose in exactly the same way as it had to be safe. Once it was realised that "Utility" was one end of a continuum of which the other end was "Opulence" then "Comfort" was chosen as the best term to represent the users internal feel of the building from an aesthetic and environmental perspective. The facet comfort has proved in subsequent studies to be an appropriate term.

9. **Facet I Flexibility -** The only additional facet now incorporated into the model is the facet "Flexibility". In a number of projects clients have rated highly the ability to change the internal and external allocation of space. After consideration it was concluded that "Flexibility" was not highly correlated with any other facets and could be added to the model.

The rules now established for addition of facets to the model are:

1. If the suggested addition is one that has to be met 100%, then this sits above the discretion given within the client's value system model and cannot be incorporated within it. Examples are fitness for purpose, safety, security and legality.
2. If the suggested addition is highly correlated to facets already contained within the model then the additional facet cannot be included unless by substitution. An example might be "ease of maintenance" which would be highly correlated with "OPEX". The implication would be that the client was willing to invest more capital to simplify maintenance. However, "OPEX" is a higher order facet and therefore the substitution would not take place. In Figure 3, which shows a completed client's value system model for a sports centre, it should be noted that the team preferred "Exchange/Income" to just "Exchange", as a key factor in this public sector project was income generation. Also they preferred "User Satisfaction/Comfort" to "Comfort". In some service projects "Reliability" has been an issue and has been included as a distinct facet.

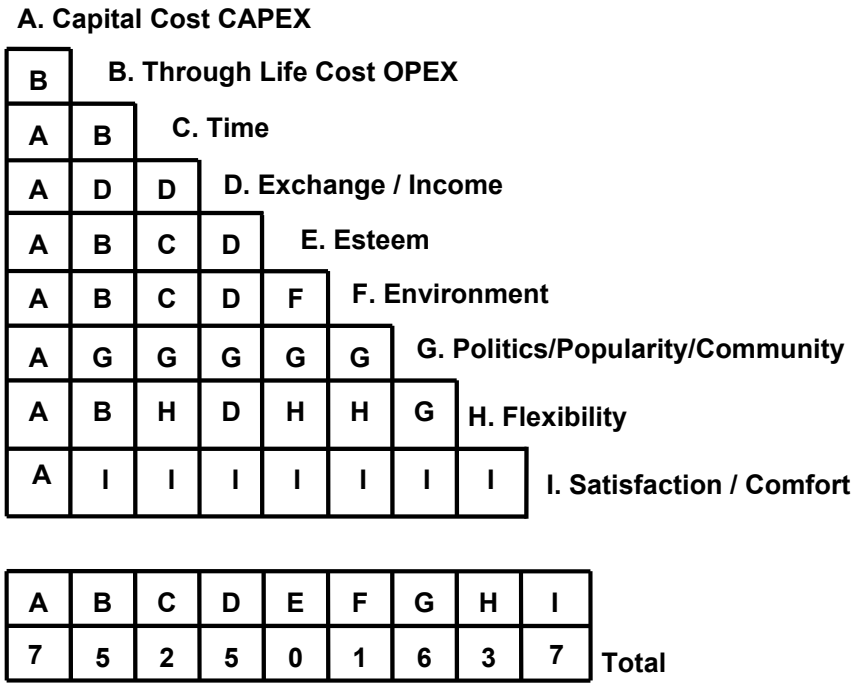

Figure 3 – Completed Client Value System Model for a Sports Centre

The interpretation of the Sports Centre Model in Figure 3 was that the client wished to keep within budget but not by compromising space, to equally maximise user satisfaction and comfort and be popular with the local community. Of lesser importance were architectural esteem, environment beyond the legislated minimum and time. A point should be made on the subject of esteem. While rated low it was the opinion of the client that no other factor should be compromised to "pay" for esteem and the sports centre was always conceived of as a large steel clad shed. In the event the architect made a bold artistic statement through the use of colour and glass. This was an example of the architect using skill to introduce an aesthetic statement without compromising the client value system.

In conclusion, the current model is successfully being used in practice and provided the contributors are restricted to the client team members only, is being efficiently completed with discussion within one hour.

PART 3 - A CRITICAL THEORECTICAL APPRAISAL OF THE MODEL

Having developed the model through an academically rigorous, recorded series of action research value management studies the final critique of the clients value system is undertaken by reference to the philosophy of a value theory. It is here that this paper strays into dangerous ground, as the subject of value from a philosophical viewpoint has been the subject of many papers over the past 100 years. It therefore might be considered courageous for someone from the construction industry to attempt to interpret and summarise concisely the philosophy of value in order to critique a theory for a client's value system derived through a structured process of action research but essentially pragmatically.

There is sufficient support within the literature for the deconstruction and quantification of value. For example, Perry (1914) states " There is but one way in which this [hierarchy] can be accomplished without abandoning our present definition of value and that is by employing a quantitative scale. In such procedure no new conception of value is introduced; interest-fulfilments are merely compounded [deconstructed] and measured. If on the other hand, interest-fulfilments are judged higher or lower by some standard, then that ulterior standard is really definitive of value".

A number of well-cited philosophers (Perry:1914; Rice:1943; Zimmerman:2001) agree on the concept that objects or services (this term is used widely) have intrinsic and extrinsic value and can be appraised on continuums commonly quoted as being good to bad. Intrinsic value is defined as those facets of an object or service that make it worthwhile and desirable for its own sake whereas extrinsic value is defined as being those facets of value observed by those with no intrinsic interest in it. This is an important distinction for the client's value system and particularly in the context of those who have a role in establishing the intrinsic value of the project.

Other terms in the literature (Audi:1999) include:

- Instrumental value - defined as the environment in which value is obtained. An object's value may be enhanced if it is contained within a particular environment. For example, a production facility on a green field site may be seen to be a shed in a field, whereas the same building on a

high-technology research park may have its value enhanced by its location. The research park therefore confers instrumental value on the production facility.

- Inherent value - is defined as the test of whether something is intrinsically valuable by experience, awareness or contemplation. If the experience or the contemplation of a project is intrinsically valuable to the client stakeholders then the test has been satisfied and the project has inherent value. The contemplation in a business sense is often represented by the outline business case, a key question for which is "does the project have inherent value?"
- Relational value - is the situation where something has value only by its relationship with something else i.e. X has value only when it is associated with Y.
- Contributory value - is the extent to which a facet contributes to the value of the thing as a whole in the context of the client's value system. The breakdown of into facets allows an appreciation of the contributory value of each facet in the context of the project as a whole.

Another factor highlighted in value theory as important is that of cognition, meaning in this context, that the client's value system is constructed on the basis of knowledge of facts and not on the basis of emotion. Therefore, it is necessary to prove by logical argument or measurement the value criteria being established, it is not sufficient to just like or dislike.

Rice (1943) identifies four kinds of value that he describes as "conative", meaning that value which springs from the pursuit of a goal or a purpose, for example the construction of a building. He breaks down conative value into practical, moral, intellectual and aesthetic as follows:

- Practical values are those values derived from the manipulation of the environment and result in the possession or consumption of a material. In the context of construction practical values are obtained from the building itself.
- Moral value is described widely as being the socialisation of the individual or corporate need by taking on the needs of others in the design of the object.
- Intellectual value is necessarily extrinsic and is the value of the intellectual stimulation from the analysis of the object by the world as a whole.
- Aesthetic value relates to the beauty of the object and where the initiative is taken by the artist in shaping our impression of the structure, texture and meaning of the object.

This section can be no more than the briefest of overview of a subject on which many hundreds of thousands of philosophical words have been written. It does however give credibility to the action of deconstruction of the client's value system, it gives a structure for the critique of the whole system and gives a sufficient flavour of the subject to be able to judge the categorisation of the client's value system as represented above.

This critique will review the nine facets of the client's value system being CAPEX, OPEX, time, environment, esteem, exchange, politics/popularity/community, flexibility, and comfort. By reference to the above theories CAPEX, OPEX, time, exchange, and flexibility are intrinsic and practical facets of value. Esteem is both intrinsic to the project and extrinsic in the context of world appreciation and expresses moral, intellectual and aesthetic factors. Environment considerations are intrinsic to the project and extrinsic in terms of impact on the rest of the world and in this context could therefore be seen as being practical, moral and some degree intellectual. Comfort is intrinsically designed into the project and affects those who use the facility, and therefore as well as practical also comprises, intellectual, moral and aesthetic factors. Politics/popularity/community

issues may be intrinsic and practical, particularly in respect of public sector projects but are mainly those extrinsic areas of the client's value system that impact on the moral, intellectual and aesthetic. The matrix in Figure 4 illustrates the deconstruction of the client's value system but also in checking the relevance and perspective of the project both to the client stakeholders and to the world as a whole. It ensures that all aspects of each facet have been properly considered in the context of its importance within the value system as a whole.

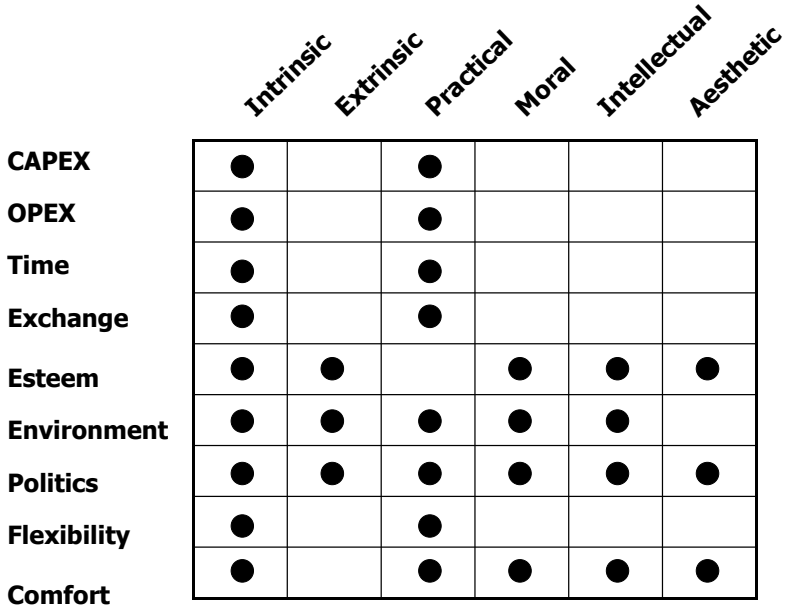

Figure 4 – Client Value System Matrix

The identity of project stakeholders and their relative input to individual facets of the value system can be decided by reference to the intrinsic and extrinsic values of the project. Stakeholders and their relative importance can be determined by reference to those who have the most to lose or gain from the project. For example, consider a primary school project. The education authority, the head teacher, the teachers, parents and pupils could be considered to be the primary stakeholders. This group of people will endeavour to transmit their value criteria to the design team responsible for the design of the school. Their stake in the project is high and they will be primarily concerned with the intrinsic and practical aspects of the project. The remainder of the local community will have a value criteria which is extrinsic and one in which the moral, intellectual and aesthetic values will have high prominence.

For a primary school project, visitors to the neighbourhood have a value system that is entirely extrinsic with a stronger focus on the aesthetic. Visitors' stakeholder rights in this context are almost zero because they have so little to lose. The same would not be true of an art gallery that has to attract visitors. In this context visitors become a primary stakeholder group and should be represented within the definition of the value system. This debate should reflect on whether the value criteria established by the sports centre client project team were right since they saw no value in esteem. In this case it could be argued that they were right, since this is a neighbourhood facility and they highlighted the importance of politics/popularity/community. The esteem value to the casual visitor or indeed the rest of the world is of little consequence.

PART 4 – CONCLUSION

The research work reported at the Denver conference, which proposed a methodology to make explicit the client's value system, was at that time in a stage of formative development. This paper has described the development of the model and the successful use of the model in value management workshops. An attempt to find weaknesses in the model through axiology has enhanced its interpretation by allowing a clear focus of the value function of each facet and an appreciation of the identity of the contributing stakeholders. Further research work will be undertaken to enhance the understanding of total quality management and quality assurance through the use of the model. Also it is proposed to use the same methodology to deconstruct risk.

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