5 Traditional Procurement is too slow

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ABSTRACT

This paper reports on an exploratory interview survey of construction project participants aimed at identifying the reasons for the decrease in use of the traditional, lump-sum, procurement system in Malaysia. The results show that most people believe it is too slow. This appears to be in part due to the contiguous nature of the various phase and stages of the process and especially the separation of the design and construction phases. The delays caused by disputes between the various parties are also seen as a contributory factor - the most prominent cause being the frequency of variations, with design and scope changes being a particular source of discontent. It is concluded that an up scaling of the whole of the time related reward/penalty system may be the most appropriate measure for the practice in future.

Keywords: Procurement, traditional system, time, cost uncertainty, buildability, fragmentation, disputes, variations.

INTRODUCTION

The traditional procurement system is predominant in the Malaysian construction industry and, until 1992 at least, able to satisfy its requirements (Masterman 1992:23-6). As is well known, it is characterised by the contractor not being responsible for the design or the documentation work (e.g., Goldfayl 1999:10-1; Rwelamila and Meyer 1999:40) and with a clear division between the design and construction process responsibilities (Rowlinson 1999:39; Martin 2000). Also, each phase in the traditional system is separate (Tenah 2001:31; Walker and Hampson 2003:14), with the design and construction processes being quite different (Wearne 1997:781). Each phase also contains different stages. The design development phase, for example, comprises project briefing, feasibility studies, outline proposals, scheme design and detail design (Smith 1998:37-8).

The reasons for the system's continuance are obvious to many observers:

- It exploits the economic potential of the free market by enabling contractors to be selected either by open or select competition among an unlimited number of prequalified competitors (Rowlinson 1999:46).
- The separation of design and construction appointment and service provision effectively restricts the amount of opportunistic business behaviour of those involved until the design is completed.
- Considerable flexibility is allowed for unforeseen events occurring during the construction phase, e.g., ground conditions, changes in scope and design, and errors in documentation (e.g., Turner 1990:76-7; Goldfayl 1999:182; Walker and Hampson 2003:14).
- It is a 'value for money' delivery system which employs participants with different talents and combines these talents into a business relationship to produce the desired results with greater certainty (Rowlinson 1999:50).

To work well, sufficient time is needed for the preparation of full documentation by all consultants and for the quantity surveyors to complete a final estimate prior to calling tenders (Neighbour 2000:16). It is also common for a period of several months to elapse from the first initiation of a project and appointment of architects to contractor selection and commencement on site (Hovet 1994). The Hong Kong Jockey Club project, for example, did not use the traditional procurement system for this

very reason as the management of the Jockey Club lacked confidence that the work would be completed within the required time frame of 4 years (Tam 1997:746). In particular, the traditional procurement requires a sufficiently lengthy tendering period, to allow for the complexity of the work and for the tenderers to read the documentation, visit the site, and prepare for the tender (Neighbour 2000:16). The traditional system is therefore often recommended for fairly simple small to medium sized projects where time is not a critical factor (Masterman 1992:40; Taylor *et al* 1999:166).

The traditional system has, however, been declining noticeably in popularity in Malaysia in recent years (Tan 2001). The same has also been noted in many countries (Mo and Ng 1997:454) - a particular criticism being that it is unable to cope with the complexity and dynamic nature of the current construction industry (Rwelamila and Meyer 1999:40). In this paper, we report on an exploratory survey conducted in Malaysia to ascertain the reasons for this decline. In particular, we are concerned with four major criticisms of the traditional system identified in the literature:

1. Time consuming aspects of the development processes
2. The effect of cost uncertainty
3. The effect on buildability
4. Fragmentation of organisational interfaces

TIME CONSUMING ASPECTS OF THE DEVELOPMENT PROCESSES

A 1997 survey showed only 54% of the clients in Malaysia to be satisfied with the completion time for traditionally procured projects (Hashim 1997:280). This may be partly attributed to the complexity in designing modern buildings (Newcombe 1996:75). The traditional system, however, has also been continuously identified as the slowest method of procuring construction projects available to a client (Masterman 1992:37; Chang and Ive 2002:696). It is said to be the most convoluted and inefficient in Malaysia (Tan cited in Hashim 1997:274) and elsewhere (Rowlinson 1999:50).

One reason given for this is that the traditional system is a sequential process (Masterman 1992:24). The construction phase, for example, should not begin until the design is completed. However, the preparation and approval of drawings, and the mistakes and discrepancies found in the design documents are frequent causes of delay in the design phase (Chan and Kumaraswamy 1997:58). As a result, whole development process is lengthened (Turner 1990:52). Similarly, when the design team permits the client to postpone the briefing decisions until the later stages, this results in key time delays – again causing the whole project to be delayed (Barnes cited in Chan and Kumaraswamy 1996:576).

Of course, the effects of delays are well documented: severe criticism arises when projects run far longer than planned and legal disputes always arise over how much responsibility each party is willing to take for delays (Chan and Kumaraswamy 1996:569-76; Tenah 2001:30); the developer may be forced to sell or lease the building to cover the interest incurred (Hashim 1997:273); although extensions of time may help the contractor, the initial completion date of the project is still affected with concomitant affects on the client (The Aqua Group 1996:114); impacts on inflation, where the final cost of large projects is much more than the first estimation (Taylor *et al* 1999:166); etc.

In an attempt to overcome thee problems, the time made available for the design phase is often reduced to below what is regarded by many practitioners as a reasonable minimum (e.g., Emmitt 1997:187). As a result, the design documents are said to be “inevitably incomplete” (Yates 2002:222; Walker and Hampson 2003:14). Errors also regularly occur in the form of differences in dimensions between plans and sections, incorrect dimensioning of walls and openings between the drawings and on-site (Ogunlana *et al* 1996:39). In many cases, project designs and bills of quantities are not prepared before the contractor is selected due to the lack of design information available (Masterman 1992:31; Rwelamila and Meyer 1999:42). Far from saving time overall, therefore, this inevitably results in delays in the construction phase due to unclear drawings and specifications, which prevents contractors planning for the resources required for the work (Chan and Kumaraswamy 1997:59).

Another implication of a reduced design period is an increase in variations later. Variations are not only a source of annoyance in terms of time and cost (Bromilow cited in Chan and Kumaraswamy 1997:59) but are "a time-consuming and expensive undertaking" (Hovet 1994). They also always lead to poor on-time performance (Chan and Kumaraswamy 1996:577).

EFFECTS OF COST UNCERTAINTY

An associated issue concerns cost uncertainty. Although the description of 'lump sum price' under the traditional system seems to imply that the cost of the project will be the amount of the accepted tender, this is rarely the case in practice (Cooke 2001:150). As Rowlinson (1999:50) and Turner (1990:79) point out, there is cost certainty only at the beginning stage of the construction process - no one actually knows the final construction project price until the project has been completed (Hovet 1994). In short, although a traditional lump sum tender may give the lowest tender price, it may not result in the lowest overall construction cost.

Because of the long period of time taken to design, document and tender, there are inevitably significant changes in the market forces, tender prices, interest and inflation rates (Lavender 1990:224; Turner 1990:76-7). Price fluctuations in construction materials have also been found to be particularly significant in economically unstable countries (Akinci and Fischer 1998:67; The Aqua Group 1999:73; Kayode cited in Akpan and Igwe 2001:367). For most projects, however, variations that occur during the construction phase have the most significant and inevitable effect on final cost (Kumaraswamy and Walker 1999:242; Rowlinson 1999:49; Rwelamila and Meyer 1999:40; Akpan and Igwe 2001:367-72). The variations result in many extra claims (Morledge 2002:185) and are often "very expensive" (Lavender 1990:223). "Scope growth" during the construction phase has been identified as a particular problem, with the majority of cost increase being derived from this source (Akinci and Fischer 1998:70)

From the clients' point of view, contractors are seeking opportunities to create profit and additional revenue (Yates 2002:223-4) and variations provide such an opportunity. Also, variations cause confrontational disputes over what might be a fair price for a project (Walker and Hampson 2003:14). In fact, it is this very issue of increased claims by low bidders that is said to be one of the reasons for the increased usage of the design and construct system (Molenaar *et al* 1999:56)

EFFECT ON BUILDABILITY

What looks good on paper or the computer screen can be difficult to build and designs are sometimes impractical (Tenah 2001:33). As mentioned earlier, this can result in variations initiated by either clients or contractors. Buildability, as "the extent to which the design of a building facilitates ease of construction, subject to the overall requirements for the completed building" is considered to be underprovided for most construction projects (CIRIA cited in Low 2001:106). It is said that clients are dissatisfied with building designs which do not provide value for money, in terms of constructability (Low and Abeyegoonasekera 2001:301); their new facilities can be difficult to operate and expensive to maintain (Markus 1997:22); productivity levels become difficult to raise and there is "incapacity to handle current realities" (Kumaraswamy and Dulaimi 2001:326); and that the neglect of buildability is just not sustainable in the long term (Barker 1998:14). This also points to the conclusion that the lowest initial cost is not necessarily the most cost effective option or provides the greatest return.

It is incumbent on designers, therefore, to incorporate buildability into their designs. To do this, it is obvious that contractors need to be involved in the design phase in order to maximise buildability, as they know the significant variables affecting their ability to complete projects within a given budget and schedule and to an acceptable level of quality (Walker and Hampson 2003:14; Ling *et al* 2004:75). With the traditional system, however, the contractor's input into the design process is "minimal" and "often nil" (Rowlinson 1999:38-9). With this separation of contractors from the design development stage, therefore, the opportunity to incorporate buildability into the design is largely lost (Masterman 1992:30; Walker and Hampson 2003:14) and clients cannot receive the best possible design solution (Love *et al* 1997:424).

Additionally, architects, who are seen to be traditionally the leader of the construction process, seem unwilling to give contractors the

leadership of this process (Dulaimi *et al* 2004:707). In reality, however, each project participant in the traditional system is a separate entity and there is no overall management and coordination in this system (Tenah 2001:31-3). It is also said that it is difficult for the architect to exercise objectivity in his/her decisions (Turner 1990:30). Moreover, the abilities of architects to manage projects have been questioned over the past two decades (Masterman 1992:33) and a better solution may be to involve the contractor more in the process.

Furthermore, one of the major problems in the traditional system is thought to be that it pushes the budget setting responsibility onto the clients and the design consultants (Masterman 1992:31; Hovet 1994). Again, this points to the possible benefits from involving the contractor more closely in the process.

FRAGMENTATION OF ORGANISATIONAL INTERFACES

It has been observed that the traditional system does not create a unified team in which experience, feedback, and new ideas are shared (Tenah 2001:33), with team members often not putting the clients' requirements as their first priority (Smith 1998:16) - resulting in completed projects that are not fully responsive to the client's needs (Markus 1997:22). The separation of design and construction is an obvious cause of this. In an organisational context, this separation extends into the various sub processes involved also. For a large construction project, these sub processes can be extensive with a concomitant effect on relationships (Harmon 2003:121). This situation, termed *the fragmentation of organisation interfaces*, has been held to be a major weakness in the traditional system (Love *et al* 1997:423).

As has been observed by many commentators, a particular problem associated with the fragmentation of organisation interfaces within the traditional system is the tendency towards adversarial relationships (e.g., McDermott 1999:12). This is said to arise predominantly because of the separation of the design and construction teams (e.g., Turner 1990:52) - a situation viewed as one of "fragmentation, friction and mistrust" (Newcombe 1997:525), with the gap between design and construction contributing to "major behavioural, cultural and organisational differences between project individuals and groups" (Love *et al* 1997:423). It is argued, for example, that the architect and other key members of the design team fail to provide essential management to coordinate the overall process of planning, design and construction (Turner 1990:32). Similarly, the rush to complete the design often creates problems in coordination between the project team members (Ogunlana *et al* 1996:39). As a result it has been suggested that communication problems can be reduced through the design and construct procurement system, for example, because of the reduced number of communication links with this approach (Kashiwagi 1999:420). Also, as Kadefors (2002:452) points out, the client fears that the contractor will scrutinise the contractual documents for errors and ambiguities that may lead to claims, exploit their monopolist position by excessive pricing of extra work, or save money by lowering quality. This client dissatisfaction has also led some researchers to conclude that the traditional system fails to provide an appropriate relationship between the client and the contractor (Ngowi 1997:556).

The problems caused by fragmentation of organisational interfaces, however, go beyond the separation of design and construction. There are "conflicts, inconsistencies and mismatches" between all the project team members (Hegazy *et al* 2001:322), possibly due to simple misunderstandings or prior assumptions or beliefs (Gardiner and Simmons 1998:36). These have often been attributed to communication difficulties caused by either language differences (Ngowi 1997:559; Loosemore and Lee 2002:518) or differences in the communicating cultures involved (Loosemore and Lee 2002:518). Chan and Kumaraswamy (1997:59), for example, report that inadequate communication among all project team members results in problems in project coordination and schedules. Likewise, Murray *et al*. (2002:157) found many communication problems at the contractor-subcontractor-architect design interfaces, while poorly communicated design changes have also been noted as leading to costly variations (Zaneldin *et al* 2001:330). In addition, culture has been identified as affecting the degree of uncertainty and anxiety of project participants – these being lower on projects where members of different organisations share the same culture (Ngowi 1997:558-61)

An alternative explanation of the source of conflict relates to the hierarchical power structure

implicit in the traditional system (Newcombe 1996:79; Liu and Fellows 1999:144) leading to conflict between the project team members and clients (Newcombe 1996:77; Girmscheid and Hartmann 2002:372). A further view is that adversarial relationships arise in the traditional system because of the liabilities and penalties on a party who has either done something wrong, or instructed another party to do something wrong (Kumaraswamy and Dulaimi 2001:325).

THE SURVEY

METHOD

Having identified the four major issues and their sub issues as described above, a questionnaire was developed to survey their extent and influence in the Malaysian construction industry. Following a small pilot study, 32 consent forms and notifications of telephone interviews were sent either electronically or mailed to a sample of architectural (5), quantity surveying (11), construction contracting (6), project management (5) and clients (5) across West and East Malaysia to obtain their permission for interview. Of the 32 consent forms and notifications of telephone interviews, 20 firms replied and accepted the interviews. Appointments for telephone interviews were made at the most convenient time for the interviewees. The 20 interviewees comprised 2 architectural, 8 quantity surveying, 4 construction contracting, 3 project management and 3 client personnel in both West and East Malaysia. All interviewees had practical experience of procurement practices in the construction industry. The wide variety of occupational groups comprising the sample was a deliberate strategy aimed at reducing the likelihood of bias due to the perspective of an individual occupation. Therefore, when all interviewees provided similar answers to a question, it was taken to imply that the answers were unbiased Being an exploratory study, it was not intended to highlight the differences between the views of the different occupations at this stage.

RESULTS

Time consuming aspects of the development processes

In response to the question “Do you think projects using the traditional procurement system in the Malaysian construction industry are generally completed on time?”, 2project managers and 4 quantity surveyors agreed that this was the case, while none of the architects, contractors and clients agreed.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Score
The process stages i.e. design development stage, documentation stage, tendering stage and construction phase have a longer duration than other non-traditional procurement methods.	0	0	4	9	7	4.15
Construction cannot commence if the design is incomplete.	0	2	4	8	6	3.90
Severe criticisms and legal disputes result in slow growth in the economy when projects are delayed.	0	1	5	14	0	3.65
The decision processes of the traditional procurement system are slow and convoluted.	0	5	2	12	1	3.45
The selection processes for architects and contractors are time consuming.	0	8	3	7	1	3.05
The time consuming aspects of the development processes contribute to the need for extension of time (E.O.T).	2	10	4	0	4	2.70

Table 1: Time consuming aspects of the development processes

Table 1 summarises the results concerning the speed of project delivery, rank ordered by weighted agreement of the respondents to six statements. This entailed weightings of Strongly Disagree=1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5 and averaged over the twenty respondents. Thus for question 1, the weighted score is [0(1)+0(2)+4(3)+9(4)+7(5)]/20=4.15. Any score over the midpoint of 3 can therefore be regarded as an agreement of some magnitude. As the Table shows, the respondents generally agreed with five of the statements and disagreed with the remaining one statement. Of the five agreed statements, the highest is "The process stages i.e. design development stage, documentation stage, tendering stage and construction phase have a longer duration than other non-traditional procurement methods", suggesting the whole of the traditional process to be cumbersome. This is followed by concern for the separation of the design and construction phases of the traditional process, with interviewees commenting that design for a construction project using the traditional system should finish before the construction phase commences in order to produce a complete bill of quantities. The effect on the economy and the speed of decision making follow, with the speed of the decision making being said to depend on the type of work, the budget and the clients involved. Some interviewees said that if the clients decided that the projects had to be done urgently, then the decision processes would be made faster and more straightforward. The interviewees were rather less certain, on the other hand, that the development process itself and the selection procedures of the architects and contractors unduly affected time.

The interviewees were also asked to rank the development stages according to the importance of each stage and how it contributed to the time consuming aspects of the processes in the traditional system. Generally, the design development stage, with an average ranking of 1.9, was found to be the most time consuming stage, followed by the construction phase (2.2) and documentation stage (2.6). The tendering stage (3.3) was considered to be the least time consuming stage.

Finally, the open ended question "What other reason/reasons do you think contribute to the extension of time in the traditional system in the Malaysian construction industry?" provided several responses:

- Majority of project details were not finalised upon tendering
- Economic factors influenced the supply and cost of construction materials
- Shortage of materials
- Financial and cash flow problems
- Poor weather conditions
- Lack of site management
- Client interference or strong involvement during design development stage
- Project complexity, size and type
- Source of materials
- Late payment of progress works
- Budget allocation or government funding
- Clients favouring certain conditions
- Variation in orders
- Poor site conditions

Effects of cost uncertainty

Table 2 provides the results of the questions relating to cost uncertainty within the traditional process. The two most agreed upon statements concern the cost uncertainty caused by the flexibility in the process to accommodate changes in the form of variations and scope changes, with some interviewees claiming that contractors were seeking opportunities to create profit and additional revenue by inducing variations. Surprisingly, however, there is lack of agreement that the price agreed early on will inevitably be different by the time the project is completed. What is generally not accepted is the statement that tender documents are not ready at tender stage.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Score
Variations often lead to unnecessary increases in the final cost of construction.	0	0	4	10	6	4.10
Cost increase derives from scope growth during the construction period.	0	1	0	18	1	3.95
The tender price accepted is not the overall construction cost of the project.	1	3	6	6	4	3.45
There is cost certainty at the commencement stage of the construction processes.	0	3	7	9	1	3.40
Very few projects are completed within the tendered price.	0	5	7	5	3	3.30
Variations occur as a result of the incomplete designs that are never finalised for tendering.	0	8	6	4	0	2.78
Full drawings and a complete bill are often not ready when a project goes to tender.	4	8	4	4	0	2.40

Table 2: Effects of cost uncertainty

Responses to the open ended question "Which aspect contributes the most to the uncertainty of cost in the use of traditional procurement system in the Malaysian construction industry?" are:

- Increase in the cost for construction materials
- Conditions of construction sites
- Uncertainty of design and lack of information given during tendering stage
- Extra claims by variations
- Uncertainty of the contribution from local authorities such as water and electricity boards
- Initial budget versus tender price due to time lapse of approximately 1 to 2 years
- Budget allocation or government funding
- Lack of complete design documents and changes to client requirements during the construction period
- Impractical designs
- Designs that are not finalised upon tendering and vary as the design develops

Finally, in response to the question "Do economic issues affect the cost certainty of traditionally procured projects in the Malaysian construction industry?", all 3 clients agreed, 3 contractors and 6 quantity surveyors, 3 project managers and 1 architect. The reasons given are that:

- A strong economy generates more new projects and thus reduces the competition among contractors, whose numbers tend not to increase as quickly. As a result, construction prices tend to increase.
- Inflation and shortage of construction materials affect the construction cost
- Contractors cannot afford to cover the construction cost based on the contract

prices when the economy is experiencing a downturn

- Shortage of reinforcement bars due to great demand in the China market (Olympic) and thus the cost of raw material increased
- The economic issue has an impact on the exchange rates of imported materials, labour market and interest rates
- Design is mainly influenced by the size of the budget

Buildability

Table 3 gives the extent of agreement concerning buildability issues, showing the greatest agreement to be that there is no buildability input by the contractor during the design stage, followed by the belief that the lowest bid does not ensure quality and the lack of integration between the design and construction processes. There was an overall lack of agreement, however, that it is difficult for architects to make objective decisions because of their dual designer-project manager role.

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Score
There is no buildability input by contractor during the design period.	0	0	3	12	5	4.10
The lowest bid does not ensure quality.	0	3	6	5	6	3.70
There is no integration between the design and construction processes.	0	5	2	11	2	3.50
The designers are not knowledgeable about the relevant design construction inputs.	0	2	9	9	0	3.35
It is difficult for an architect to exercise decision objectivity in playing the roles of both designer and project manager.	1	10	3	5	1	2.75

Table 3: Effects on buildability

In response to the question “Should contractors participate in the design stage?”, 1 architect agreed, with 3 quantity surveyors, 1 client and 1 project managers, but no contractors. However, in response to the question “Are contractors the best advisers on how to meet design specifications in a cost effective and timely manner?” all contractors agreed, 2 clients, 2 project managers, 1 architect and 4 quantity surveyors.

Finally, the open-ended question “Why do contractors submit unrealistically low bids?” produced the following responses:

- Competition to secure projects is very high. Thus submitting unrealistic low bids ensure that the contractors win the project
- To survive during economic downturn and roll over until a more lucrative/ productive time
- Intention to claim variations during construction period
- Time is too short to study the bid carefully thus the design concept is misunderstood
- Not really intending to win the job
- Some may be unfamiliar with the design and construction process, resulting in the underestimation of bids
- Poor construction knowledge

Fragmentation of organisational interfaces

In response to the question “Do you think that the separation of the design teams from the construction teams during project development period leads to adversarial attitudes amongst team members?”, 3contractors agreed, 2 clients, 1 architect, 4 quantity surveyors and 1 project manager. During the interviews, the contractors mentioned that adversarial relationships arise when they discover that some of the designs are not practical during the construction period, while

the architects have a similar point of view as the contractors in that adversarial attitudes arise when the contractors query designs that are not practical. Designs are then amended according to contractors' preferences. Consequently, variations occur and the project cost increases. Some of the quantity surveyors stated that the design and construction processes are integrated and no adversarial attitude exists among team members. Some further explained that in most cases the design teams and the construction teams manage to communicate well and ideas are shared among them in order to solve any inter-team problems.

The responses to the statement "Traditional procurement does not create a unified team in which experience, feedback and new ideas are shared" were mixed, with 11 agreeing, 7 disagreeing and 2 neutral. For some of the contractor interviewees, the traditional system does not create a unified team because contractors are only involved in the process at a later stage where most problems occur. This position is also maintained by the architects who stated there is no integration between the design and construction processes since the architects are in charge of the design process and the contractors are in charge of the construction process. However, the majority of the quantity surveyors contend that they resolve problems by discussing them with the team members.

In response to the question "Do different cultural backgrounds of project team members contribute to an adversarial relationship between project team members?", all architects agreed, followed by 2 clients, 2 project managers, 2 quantity surveyors and 1 contractor.

Of the situations contributing most to the adversarial relationship between project team members and clients, "Clients and project team members emphasize different goals respectively" was ranked highest, followed by "Project team members often do not put clients' requirements as their first priority", "Simple misunderstanding and assumptions" and "Clients' mistrust of contractors with regard to claims". Several of the interviewees mentioned that clients would have identified the contractors' prior background and experience during the tendering stage and therefore already in a position to enter into trusting relationship.

Factors most contributing to the decline of use of the traditional procurement system

The interviewees were asked to rank in order of importance the above factors (1-4) that have or will contribute to the decline in the use of the traditional procurement system in the Malaysian construction industry. Most of the interviewees ranked time consuming aspects of the development processes as the main factor. According to the interviewees, any delay in project implementation which is already planned will slow down the social or economic development of Malaysia and thus timing is a critical issue. It is interesting to note that all the clients ranked time consuming aspects of the development processes as the main factor. The clients responded that they need to finish and sell their development projects during a healthy economy. Any delay in project implementation will increase holding and financing costs and therefore reduce profit. In the worst case, massive losses may be incurred causing abandoned or unfinished projects when there is a downturn in the economy. Architects also reported that changing designs to accommodate changing clients' requirements was very time consuming, causing the designs to be unfinished at tender stage.

Cost uncertainty was ranked the second factor, with cost uncertainty occurring as a result of variations either by clients or contractors. Fragmentation of organisational interfaces and poor buildability were ranked as the least important factors. The majority of the interviewees said that buildability in the traditional system still satisfied the Malaysian construction industry. It was considered by many, however, that it would still be advantageous for contractors to participate in the design stage.

DISCUSSION AND CONCLUSION

In surveying the reasons for the decreasing popularity of the traditional procurement system in Malaysia, it was found that the main cause is attributable to the rather lengthy process involved. The clients surveyed were particularly vociferous in this respect, with all those interviewed naming this as the most important issue at stake. This seems to be in part due to the contiguous nature of the various phase and stages of the process and especially the separation of the design and construction phases, in which the design is intended to be competed before the appointment of the

contractor and commencement of construction work. Also associated with the time aspects of the process is the delays caused by disputes between the various parties concerned for a variety of reasons, the most prominent of which appears to be the frequency of variations. Variations also occur as a major source of cost uncertainty, with design and scope changes being a particular source of discontent.

Apart from the quantity surveyors, most interviewees found the ideal of a cohesive and unified project team to be seldom attained, but a less significance factor in the demise of the traditional system - the most significant problem again being seen as the belated introduction of the contractor to the team.

Although coming from only a very small sample of industry participants, the results are, we suggest, at least indicative of what is inappropriate about the tradition system and hence what improvements are likely to be beneficial. Firstly, it is clear participants need a speedier process. It is obvious that the traditional system must have evolved in less frantic times and, for whatever reason, has failed to evolve sufficiently to meet current requirements. The separation of design and construction is seen to be more of a barrier to increased speed of development than of straight cost or quality issues surrounding integrated teamwork or buildability. Similarly, the adverse time effects of the traditional process in accommodating scope and design changes are seen to outweigh the advantages of the flexibility provided.

Viewed in this light, the thorny question of how and when to introduce the contractor into the process takes on a new shape. Will early involvement of the contractor help speed up the overall development process? Or will it slow the process down? Bearing in mind the fact that, although all of the contractor interviewees believed their early entry would benefit the process, none wanted to do it. Contracting being an essentially commercial activity (in contrast with the consultants' service role), this suggests a closer look at the development team fee structure will be beneficial. In fact, the knowledge that the speed of the process is the most important aspect, suggests that an up scaling of the whole of the time related reward/penalty system (perhaps aimed at the whole project team instead of individuals as is at the moment) may well be the most appropriate measure for the future.

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