Factors Affecting the Selection of Building Contract Payment Systems

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Abstract

The selection and development of an appropriate project cash-flow model can promote the Egan principles of integration and early project based planning. This is a fundamental concept behind a research project that aims to encourage the use of appropriate innovative payment systems in the UK building industry. The project, which is funded by the Engineering and Physical Science Research Council (EPSRC), investigates the potential advantages of using payment systems by linking them to project characteristics and performance. This paper identifies the alternative payment mechanisms available for use in the building industry; and investigates whether practitioners are providing appropriate advice to their clients on the selection of appropriate payment systems for their projects. The paper then considers data gathered through direct interaction with practitioners so as to explore current practice on the ground. This contact was iterative in its nature and this process was continued into the next stage of the project through the use of conference type discussions. The preliminary finding from this phase of data collection and analysis is that the payment system selection process itself lacks coherence and consistency. This lack of consistency in practice suggests an ad-hoc approach to the selection of payment systems, which could be a constraint on the delivery of post Egan change in practice. This interim finding reinforces the case for the research and the paper concludes by outlining the next phases of activity.

Keywords: building industry, cash-flow, Egan principles, payment system.

1. Introduction

For what can be regarded as a very long time now, the construction industry has been shown to be inefficient and unproductive which has been made more obvious by the success of other industries, such as manufacturing, that are sometimes using similar approaches. The Latham Report (Latham 1994) [1], for example has highlighted inadequacies in contracting per se whilst the Egan Report (Egan 1998) [2] featured major clients who are not happy with the traditional methods. The construction industry has been recognised as a financially higher risk industry (Ruddock, 1996) [3]. The nature of the industry is such that generally the
project construction team prefinances the project and then relies on being reimbursed for the works to progress diligently. Unfortunately though, many main contractors have faced severe financial difficulties when their source of cash flow to execute contracts slows down, and even in some cases, ceases altogether. Subcontractors and suppliers are often at the mercy of their main contractors who sometimes refuse to release their payments accordingly. The lack of money in the industry is made worse by the lack of trust amongst supply chain players.

It is thus paramount that the industry moves away from the non productive approaches it has been renowned for in the past. This should include establishing effective means of ensuring cash flows to the entire project construction team. This research project believes that payment systems can assist the building industry to be more efficient and productive. There are novel alternative payment systems that are effective contract management approaches. The issues raised in this paper can be a source of encouragement to clients and their advisers to endeavour in designing and choosing the appropriate payment systems for their projects so as to achieve better success in project delivery.

The paper starts by referring to literature review noting the pricing and payment systems in use in the global building industry and the forms of contracts in which they are applicable. This is then followed by consideration of the data from the interview survey focussing on the systems in use in the UK and the factors that influence practitioners’ choices. Each of the eight most common factors is then discussed.

2. Pricing, payment and contracting systems

A study by Njie et al. (2005) [4] reviews relevant literature and identifies several pricing and payment systems used in the global building industry. These systems are illustrated in Figure 1 with five systems categorised under payment systems exclusively for payment only and eight others under pricing systems for both pricing and payment. This research project assumes payment systems to refer to the approach in which building products and services are priced and paid for.

Standard forms of contracts for building works often require the client to make periodic payment of the agreed contract sum to the contractor. It is the principles behind these contracts with regard to their pricing/tender and payment procedures that this study is based on. Table 1 from Njie et al. (2005) [4] illustrates the most common standard forms of building contracts with their associated existing payment systems. The novel payment systems such as the stage payments, incentive contracting, direct payment, trust accounts/funds, mobilisation advance payment and the mechanic’s lien can be used with any contracting system. Standard forms for civil engineering projects, notably the ICE and FIDIC, use the same payment systems as their corresponding JCT contracts.
The first phase of the research project started with a comprehensive review of the relevant literature on issues concerning the payment systems in use in the building industry in the UK as well as elsewhere. This was followed by data collection through direct interaction with practitioners so as to explore current practice on the ground. This contact was iterative in its nature and structured interviews with six questions were carried out with eight practitioners whose businesses were located in both Scotland and England. The professional backgrounds of the interviewees were: consultant quantity surveyors-5 number, architect-1 number, building services subcontractor-1 number and PFI project company-1 number. A short
description of each of the eight companies interviewed is made as follows: Pilot Company, and Companies V, Y and Z are leading consultancy firms operating worldwide providing cost and risk advice; Company T is a project company that was set up to work exclusively on PFI projects; Company U is a regional consultancy firm providing cost and risk advice; Company W is a building services subcontractor; and Company X is a regional consultancy firm providing architectural and design advice for predominantly housing association work. The sample of firms for the interviews was primarily provided by members of the project steering group. The intention was to provide a good mix of practitioners in both Scotland and England. The sample is however, not necessarily a structured, representative sample of the UK building industry. Only two of the six questions are considered in this paper.

### 3.1 Pricing and payment systems in use

Table 2 shows that the traditional pricing and payment systems of the unit-price and lump-sum remain the most frequently used systems by six out of the eight companies interviewed. The two other systems that are the first choice to these companies are the stage payment and the PFI payment mechanism. Others, such as direct payment, mobilisation advance payment, cost-reimbursables and trust accounts/funds are used, in that order, as alternatives with trust accounts/funds also as the system most said to be not in use. Whilst the incentives, management contracting payment mechanism, construction guarantee funds and the mechanic’s lien are not used at all.

**Table 2 - the pricing and payment systems in use**

<table>
<thead>
<tr>
<th>Item ref.</th>
<th>Company</th>
<th>Most Used</th>
<th>Others Used</th>
<th>Not Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pilot Company</td>
<td>b</td>
<td>a, c, f and j</td>
<td>d, e and h</td>
</tr>
<tr>
<td>2</td>
<td>Company Z</td>
<td>d</td>
<td>many incl. f, a and b</td>
<td>g</td>
</tr>
<tr>
<td>3</td>
<td>Company Y</td>
<td>b</td>
<td>a, c, d, g, and h</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Company X</td>
<td>b</td>
<td>a</td>
<td>c, g and h</td>
</tr>
<tr>
<td>5</td>
<td>Company W</td>
<td>a</td>
<td>b</td>
<td>c, d and h</td>
</tr>
<tr>
<td>6</td>
<td>Company V</td>
<td>a</td>
<td>d, b, f and h</td>
<td>c and g</td>
</tr>
<tr>
<td>7</td>
<td>Company U</td>
<td>b</td>
<td>f, a and h</td>
<td>g and k</td>
</tr>
<tr>
<td>8</td>
<td>Company T</td>
<td>j</td>
<td>f and h</td>
<td>d and g</td>
</tr>
</tbody>
</table>

**Key:**

a. Payment requests for lump-sum contracts  
b. Payment requests for unit-price contracts  
c. Payment requests for cost-reimbursable contracts  
d. Stage payment (also the pre-agreed cash flow, s-curve or drawdown schedule)  
e. Incentive contracts  
f. Direct payment  
g. Payments from trust accounts/funds  
h. ‘Client financed construction’ procedure/mobilisation advance payment
The eight companies interviewed consider nineteen factors when choosing payment systems with eight of these factors being considered by at least two companies. These eight factors are procurement (Companies U, V, Z and Pilot); risk (Companies V, W, Y and Z); project characteristics/circumstances (Companies U, V and Y); project duration (Companies V and Pilot); project complexity (Companies W and Pilot); project stakeholders (Companies Y and Z); client’s requirements (Companies U and Y); and client’s experience (Companies V and Z). The eight factors are put in three clusters (see Figure 2) i.e. procurement and risk as the most considered - that is by four companies. Followed by Project characteristics/circumstances which is considered by three companies. And then the remaining five factors which are considered by two companies.
4. Discussions

4.1 Pricing and payment systems in use

The companies interviewed demonstrate different perceptions of pricing and payment systems. For instance, Pilot Company appears to regard any payment method that does not allow monthly payment as inappropriate and paying monthly in arrears as a payment method. Paying monthly should, however, be seen as a feature of a payment system to indicate the payment interval or period. Company Y seems to regard the traditional pricing and payment method as any method based on valuation of actual work done. This to them only includes the unit price and lump sum methods and excludes payments based on monthly pre-agreed cash flow, s-curve. Company V also seems to misunderstand issues concerning payment systems by focussing mainly on the payment period.

The companies who are fully engaged in decisions on payment systems get involved at the strategic end of the project when clients are making decisions on procurement and contracting issues. The majority of the eight companies interviewed simply use the payment terms and systems within the client’s chosen contract and/or procurement strategy. Perhaps the use in the UK of the traditional procurement method (i.e. the lump sum), as shown in a survey by the RICS Construction Faculty (2003) [5], suggests why the traditional payment methods are also still the first choice.

Some of the companies have showed resistance to using alternatives to traditional payment methods such as stage payments. This suggests that adherence to routine is seen as a way of avoiding another risk that is to be managed. This is a human/social issue rather than a technical issue. The lack of use of alternatives also suggests that the durability of professional roles is preventing experimentation with payment systems. Another interesting observation is that the authority of partners is critical in the choice of payment system to use. Decisions and preferences on payment terms and systems used seem to depend on the partner-in-charge. As is the case with Companies Y and Z and also with Pilot Company and Company V, partners in the same organisation are using different payment systems. This suggests that such organisations are ready to be flexible and are not acting as champions for any particular payment system.

4.2 Factors for choosing payment systems

Construction contracts normally stipulate that the client makes part payments of the contract sum to the main contractor as the work progresses. As indicated by Harvey & Ashworth (1993) [6], it is unusual, except possibly with the smallest of projects, for the whole work to be completed before any payment is made. The procedure followed depends very much on the position of the client and the type of construction
involved. The eight companies interviewed consider several factors when choosing payment systems the most common of which are discussed below.

4.2.1 Procurement

It is vital to accomplishing project success to ensure that at an early stage special care is taken in selecting the most suitable organisation for the design and construction process. This organisational concept is referred to by Masterman (2002) [7] as the “procurement system” defined as the organisational structure adopted by the client for the implementation, and at times eventual operation, of a project. Procurement is an approach used by an industry to organise itself to execute projects. Building procurement is about the practical manner clients who want to build proceed to obtain that building. Most potential clients of the construction industry have to cope with a variety of complex skills and resources that are necessary to produce the building to accomplish their needs. It is only the simplest of buildings that do not demand the management, design, assembly and commissioning of large quantities of raw materials and the use of significant labour resources over a long period of time. The completed building is the end product of the integration of the diverse skills of the entire members of the professional and physical construction project team including the client. All those involve collaborate closely to deliver the required result to the specified quality and value for money.

Company V cites as example, the choice of a procurement route, such as construction management by major repeat airport clients who have the set up to handle large sums of money a month and the volume of certification and paper processing that go with it. This is not the case for the smaller provincial airport client who has limited number of personnel. So the overriding factor to Company V is not to design a payment system but to choose a route which is more applicable or manageable to a client.

4.2.2 Risk

As reiterated by Flanagan & Norman (1993) [8], the construction industry is exposed to more risk and uncertainty than perhaps any other industry. The construction industry is different from other industries in many ways such as: its traditional processes of delivering projects, temporary project teams, adversarial attitudes, bespoke products, unique site and ground conditions, and complex contractual arrangements. It is these differences which make up the distinguishing characteristics of the construction industry and why it is regarded by many as unique.

There are all sorts of risks arising from both the internal and external environment of a project or organisation and affecting the project performance in terms of successful delivery of project success factors such as completion of time, within budget and of the specified
performance. There are contractual implications that emanate from these consequences. It is thus vital that the client and project teams possibly led by a professional project manager consider the risk factors adequately and early enough to avoid their occurrence which could have damaging effects on the project and its performance. The client’s approach to risk management is important, for example, as noted by Company T, to eliminate the risk of it overpaying the contractor such that it will be able to step in to complete the works if the contractor was to go burst. Also, the selection and use of an advance payment method to carry out work (which is basically a client financing approach to provide funds to the contractor before they are due) is quite risky, and therefore it is necessary to find ways and means of mitigating such risks (Abeysekera, 2002) [9]. The importance of risk management is further emphasised by Pilot Company who recognises that the chosen procurement route depends on how much risk is shared in the project and how much risk is allocated to the contractor.

### 4.2.3 Project characteristics/circumstances

There are many variables that make up a project’s characteristics such as building type, building size, project complexity, project duration, one-off nature and the composition of the supply chain including specialists work’s subcontractors. All these will have significant impact on the procurement and contractual options including their pricing and payment terms. As clients become ever more sophisticated, knowledgeable and demanding and projects become ever more complex and difficult, there is greater pressure on the client’s professional advisers to choose the most appropriate options to ensure success in project delivery. As such, Company Y, for example, would design a payment system that assists the contractor if it is a large project that requires a large amount of plant to be brought to site before any site activity starts. However, they only provide assistance, such as advance payments, where the contractor needs it. Also, in some types of construction, such as housing, specified payments are made at the completion of particular stages of the project or at defined points of progress, such as at completion of excavation and foundation, at completion of framing to enclose the structure, at installation of mechanical and electrical rough-in, at completion of the interior finish, and at full completion. A payment system should be unique to the project circumstances.

### 4.2.4 Project duration

Although a variable of project characteristics, project duration has been found important enough to be treated separately. It is one of those client’s requirements whose achievement indicates project success (Chinyio et al., 1998 [10], Cornick & Mather, 1999 [11] and Winch, 2002 [12]). It would also affect the choice of payment system. If the client regards time of completion as of great essence, the contract can include provisions for the contractor to receive, on top of the base fee, a fixed amount of money for each day of useful occupancy gained by the client prior to the originally agreed-on completion date. This provision can be extended such that the contractor’s fee can be reduced by the same sum for each day
completion is delayed. There are a number of incentivisation and disincentivisation provisions used in the construction industry as identified by Bubshait (2003) [13] and Arditi & Yasamis (1998) [14].

### 4.2.5 Project complexity

Although a variable of project characteristics, project complexity, like project duration, has been found important enough to be treated separately. Decision makers should factor it in their decision-making process. For example, the lump-sum type of contract, according to Clough & Sears (1994) [15], is popular with clients for the obvious reason that the total cost of the project is known in advance. Nonetheless, its use is limited, of necessity, to construction projects that can be accurately and fully described at the tender or negotiation stage. As a result, they are generally used for residential and building construction. If it is not possible to accurately determine the nature and quantity of the work prior to the start of site activities, then the lump-sum type of contract with its inherent payment terms is not suitable.

### 4.2.6 Project stakeholders

The influences of the project stakeholders along with uncertainty are two factors, in particular, maintained by Kolltveit & Grønhaug (2004) [16] to affect project performance. Several stakeholders can be involved in a major and complex project. The internal stakeholders, such as the project client, project sponsor, project manager and other members of the supply chain, are individuals and/or organisations involved in the project activities. The external stakeholders, such as the community in which the project is being built and pressure groups, for example, environmentalists, are individuals and/or organisations who may be affected by the project activities. The external stakeholders, and maybe even some members of the internal stakeholders, have their own expectations which may not be compatible to the corporate project objectives. It is thus vital to recognise the influence each of these stakeholders are exerting, or trying to exert, on the project so as to sensitise them adequately and to benefit from the payment system that is selected.

### 4.2.7 Client’s requirements

As put by Company Z, the client’s objectives - delivering what the client actually needs - is the main and most important driver in anything. For example, if the client requires that he does not pay for QS fees for the valuation exercise, Company Y would set up a system where the contractor bills the client and then point out to the client the risk of doing this for the client to find a balance. Also, although Company U tends to pay at monthly intervals, it also considers the client’s need to adjust the payment intervals to suit the client and then incorporate it in the tender/contract documents. It may be that the client’s requirements and the circumstances of the project, for example, are that the client has to spend a sum of money by a certain time, say at the end of the financial year. This may then influence the
procurement route chosen, for example, to use two-stage tendering to speed up the process of getting the contractor to site so that the client can make payment to meet the deadline and release the money at a certain date. Every project should be looked on its own merit.

4.2.8 Client’s experience

The bigger and more experienced clients, unlike the one-off clients, have their own preferred protocols which involves specific project pricing and payment options. The client may have preferred payment terms, for example, not to have a retention system on partnering projects because of the trust and long standing relationship over a period of a framework between the contracting parties. The experienced clients like the United Kingdom Ministry of Defence can invest in developing payment processes that are efficient enough to be applied across their projects. The choice of payment system would therefore depend on the client’s experience in managing projects.

5. Conclusions

The unit-price and lump sum (traditional) payment systems are still mostly used and are said to be satisfactory. There is resistance to using alternatives to traditional payment methods such as stage payments, incentives, direct and advance payments which suggests routines as a way of avoiding another risk that is to be managed. This is a human/social issue rather than a technical issue. The lack of use of alternatives also suggests that the durability of conventional professional roles is preventing experimentation with payment systems. This was the case with procurement systems sometime ago - so change will take sometime to implement. Another interesting observation is that the authority of partners is critical in the choice of payment system to use. Decisions and preferences on payment terms and systems used seem to depend on the partner-in-charge. Partners in the same organisation are using different payment systems. This suggests that such organisations are ready to be flexible and are not acting as champions for any particular payment system.

The common factors that are considered when choosing payment systems are grouped in this order: procurement and risk; project characteristics/circumstances; and project duration, project complexity, project stakeholders, client’s requirements and client’s experience. A closer look at these eight factors suggests that at least some of these companies are deciding on payment systems that are project focused. For instance, decisions are made based on the desired objectives to be achieved and separate considerations are made depending on whether it is for stage payments or for different procurement routes such as PFI and partnering. Nonetheless, although, the companies identified these eight factors, they have also made it clear that when it comes to making the actual decision it is the client’s requirement and what is contained in the chosen contract that matters. They base their decisions on payment terms and systems on what is contained in the chosen standard form of contract or what suits the preferred procurement system or client protocol i.e. what a particular client normally uses or prescribes. The systems (contracting, procurement and payment) that the clients and
consultants are using are the ones they are comfortable and happy with. Clients are not asking for advice on payment systems and decide on payment terms and systems prior to appointment of professional consultants who only adopt systems prescribed by clients and tend not to offer any advice.

Despite some of the companies seeming to have some form of strategy in place for deciding on payment terms/systems, on the whole, due to lack of any consistency, it is not clear whether these companies have a systematic process in place when they are considering payment issues. It could thus be implied that these companies seem to do everything ad hoc and follow their instincts and/or have no methodology.

The research project is currently conducting case studies on building projects which are using innovative forms of payment systems and have been through a partnering process and from live projects from the retail, commercial and social housing sub-markets. Ideally, all the key members of the supply chain should participate in the conference type discussions. The next phase of the project will result in the development of the computer-based simulator that will be used to analyse and assess alternative payment systems, so as to act as an aid to design or “fine-tune” payment systems to individual projects characteristics and needs, and also be used by projects’ stakeholders to forecast and plan their cash flow once a payment system is defined.

6. References


