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MACRO ANALYSIS OF CONSTRUCTION PROCUREMENT TRENDS IN SRI LANKA

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ABSTRACT: The procurement system is a key means through which the client creates pre-conditions for successful achievement of project specific objectives. Various factors affect the use and development of procurement systems in any construction industry. Thus, it is interesting to discover different systems being used in different instances. This paper presents the results of a Panel Data Analysis carried out among major contracting organizations in Sri Lanka on procurement systems use to discern the trend from year 1977 to 2003. The paper also aims to shed some light on the underlying factors that affected the change of procurement systems in Sri Lanka during the period concerned. The results clearly highlight the dominance of Measure and Pay method throughout the period. Government as a major client and the regulator neglected the development of alternative procurement methods. In addition, it was found that the combination of national culture and organizational culture of construction has created an environment that did not favor the use of new procurement methods. However, economic growth has favored some of the alternative methods to emerge in Sri Lanka.

Key words: Construction industry, Procurement, Procurement trend, Procurement selection

1. INTRODUCTION

As the construction industry is an open system, which is very sensitive to change, its characterization throughout the world is determined by the operating external environment, which consists of subsystems such as economical, political, financial, legal and technological (Rowlinson, 1999). This has resulted to the industry to be in a challenging state in addressing the changes forced by the subsystems in an efficient and effective manner. Thus, the construction industries in the world are striving to tackle these changes through the new and innovative ways of construction, efficient resource utilization and better organization of projects. Consequently, construction project procurement systems practiced in the industry have also been subjected to changes resulting in many newly developed procurement systems that could be used to meet contemporary requirements.

This paper discusses the change of procurement trend in the construction industry of Sri Lanka, focusing on the building sub-sector from year 1977 to 2003. The underlying factors responsible for the change are discussed with comparisons from other countries.

2. CONSTRUCTION PROCUREMENT

The procurement concept in construction has been defined in many ways (McDermott, 1999; Love et.al. 1998). Masterman (1992) considered a construction procurement system to be “the organizational structure adopted by the client for the management of design and construction of a building project”. In a more elaborative way, Love et. al. (1998) viewed procurement systems as, “an organizational structure that arranges specific responsibilities and authorities to participants and defines the relationship of the various elements in the construction projects”. In an attempt to develop a widely applicable definition, CIB at its

commission meeting in 1991, developed a working definition for procurement systems as “the framework within which construction is brought about acquired or obtained”(CIB, 1991).

NEDO (1983), Masterman (1992), Frank (1998) and many other authors in procurement have attempted in categorizing procurement systems in many ways. Based on the recent literature, procurement systems are categorized into four broader types in this study: Separated systems; Integrated systems; Management oriented systems; and Collaborative systems. Table 1 illustrates this classification with most common arrangements belong to each category, supported by a brief description of each system:

Table 1. Categorization of Procurement Systems

Category	Variants
Separated systems	Lump Sum, Measure and Pay, Prime cost
Integrated systems	Design and Build, Package Deal, Turnkey, Develop and Construct, Novated Design and Build, Concession Contracts, All-in contracts
Management oriented systems	Construction Management, Management Contracting, Design and Manage
Collaborative systems	Partnering, Joint Ventures, Alliancing, Voluntary Arrangements

2.1. Separated Procurement Systems

These systems are also known as ‘traditional’ systems. The key characteristics of these systems are the rigid separation of design and the construction process and lack of integration across this boundary (Cox and Townsend, 1998). In this system, client appoints an independent team of consultants on a fee basis, who fully design the project and prepare tender documentation upon which competitive bids are obtained from the contractors. The successful tenderer enters into a direct contract with the client and carries out the work under the supervision of the consultants. These systems offer minimal input of contractors to the design process (Rowlinson, 1999). The most common variants of the separated systems are the Lump Sum, Measure and Pay and Prime Cost.

2.2 Integrated Procurement Systems

Integrated Procurement Systems simply means that one contracting organization offers to undertake the sole responsibility of design and construction of a project. Although, the contractor assumes the overall responsibility for project delivery, the client may appoint an independent adviser to monitor quality and cost (Cox and Townsend, 1998). There are some variants to the integrated procurement system, which have been introduced to bring more competition into the process and to achieve the balance of allocation of risks (Valance and Akintoye, 1996). The range of services offered by the contractor varies greatly with these variants (Frank, 1997). With some variants contractors find sites, arrange mortgages, sales and finance. Some even operate the constructed facility in addition to design and construction. The common variants are the Design and Build, Package Deal, Turnkey, Develop and Construct, Novated Design and Build and concession contracts such as BOT,

BOO, BOOT etc., It has been widely accepted that closer integration of design and construction is a benefit of the system (McDermott, 1999).

2.2. Management Oriented Systems

The basic feature of these arrangements is the separation of management function from design and construction. With these arrangements client enters into a contract with an external organization, which is responsible for management and coordination of design and construction of the work. The common variants to these systems are Management Contracting and Construction Management.

2.3. Collaborative Systems

The basic principle of these systems is the collaboration between two or more parties to achieve successful project objectives through fair dealings, commitment, and shared investment. Various forms of joint ventures through combine investment of capital and expertise to undertake the works are also considered as collaborative procurement systems (De Valence and Huon, 1999). Partnering is the latest collaborative system that has enjoyed an increasing attention globally. Crowley and Karim (1995) stated that partnering is a decentralized organizational structure that allows better flexibility in meeting specific project needs through increased organizational competence. The common variants to the Collaborative systems are Partnering, Joint ventures, Alliancing and Voluntary Arrangements.

3. PROCUREMENT SELECTION

Different procurement systems are used for different projects and the correct choice may help avoid problems and be the key to the attainment of project specific goals. Procurement selection therefore received much attention from researchers in recent past. They strived to develop a systematic approach for procurement selection (NEDO 1985; Skitmore and Mardson, 1988; Masterman, 1992; Chan et.al., 2001; Cheung et.al., 2001; Luu et.al., 2003). Among the various models, Multi Attribute Utility Technique (MAUT) received the greatest attention. Chang and Ive (2002) discussed some of the inherent problems of using MAUT for procurement selection. One of strongest criticisms was the selection of procurement variables. The other is the utility value developed through opinions of industry experts. Particularly they are critical about the subjective nature of assigning values to procurement selection parameters to obtain mean utility values. Chan et.al. (2001) used Delphi Method and Cheung et.al. (2001) used Analytical Hierarchy Process to reduce the subjectivity of arriving at the utility values. Luu et.al., (2003) on the other hand used 34 parameters against 8– 10 used by other researchers to develop an acceptable model. However, these models use opinion to arrive at the most suitable procurement method for a project. Another pertinent question is that, in reality does the client or his representative use a structured model for procurement selection? According to Masterman, (1992) the practice of procurement selection is rather unstructured and ad hoc. This observation is of course very true for a developing country like Sri Lanka (Rameezdeen and De Silva, 2002). This study examines the trend of procurement use in the past and explores the factors that influenced it. It differs from most of the related research on procurement selection in two respects. First, the study focuses on the past trend of procurement use in Sri Lanka. The factors that led to the use of a particular set of procurement methods and its change over time gives an ex-post picture of the parameters affecting procurement selection. One of the features of this paper is the use of this empirical data to explore procurement selection criteria. Second, most studies have employed

a large number of variables in procurement selection. However, in reality whether such a large number of variables considered in procurement selection is doubtful.

4. METHODOLOGY

The necessary data, among other information, were collected from building projects undertaken by M1 and M2 grade contractors in Sri Lanka. The regulatory authority of construction in Sri Lanka namely, the Institute for Construction Training And Development (ICTAD) categorizes contractors into grades. M1 contractors are eligible for construction of buildings over Rs.300 million in value. M2 grade contractors are eligible for construction of buildings between of Rs.150 and 300 million in value. The method used for the collection of data was a survey on project documents in four panels. A random sample of M1 and M2 grade contractors were selected from the ICTAD list of registered contractors. Projects undertaken by those contractors became the subjects of this study. The first panel of data was collected in 1992 corresponding to projects undertaken during 1977-1992 period. The second panel of data was collected in 1997 corresponding to 1992-1996 period. Similarly, surveys in 2001 for 1997-2000 data and early 2004 for 2001-2003 data were carried out. Panel Data Analysis refers to the pooling of observations on a cross-section of the subjects over several periods of time. (Tan, 2002). It follows a given sample of individual over time, and thus provides multiple observations on each individual in the sample (Hsiao, 2003). Thus, the same set of contractors was visited all along four panels. The sample represents approximately 73% of the total population of M1 and M2 contractors operating in Sri Lanka. This is considered to be a good representation and these contractors together cover a major portion of large building projects in Sri Lanka. Table 2 presents the profile of the contractors participated in the survey.

Table 2. Profile of the Sample

Grade	Sample	Number of registered Contractors
M1	12	15
M2	12	18
Total	24	33

5. TREND OF PROCUREMENT SYSTEMS USE IN SRI LANKA

The result of Panel Data Analysis is presented in Table 3. It gives the usage rate of various procurement methods over time. The results clearly highlight the dominance of Measure and Pay system throughout the period. It ranges between 50 – 72 percent. The share decreased considerably in certain periods (particularly during 1982-1986 and 1992-1996) paving way for other systems. Majority of public works in Sri Lanka are found to be procured using this method. Transparency and accountability are the main driving forces for favoring this method over others in the public sector.

The Lump Sum arrangement ranges between 5-12% of the total. This system is popular among private sector clients in Sri Lanka. There is a clear decline of Prime Cost as a procurement system in large building projects. However, it is the most favored system in the informal sector of the industry. Informal sector accounts for a considerable amount of workload in the housing sub-sector. Design and Build has recorded a usage rate of 20-35% over the years. This system is used mainly for industrial buildings in Sri Lanka. It was found that they are mainly of prefabricated type. Management contracting records only 1%

throughout the study period. Only few projects have been procured through this method and all of them were very complex and large-scale. Collaborative systems have just started to emerge. It was observed that this is due to the involvement of international contractors in Sri Lanka. International contractors form joint venture arrangements with local counterparts when entering the Sri Lankan market.

The following section explores the variables that can be used to describe the observed trend in procurement usage.

Table 3. Trend of the use of Construction Procurement Systems in Sri Lanka

Procurement System	% Use (average)					
	197 7 - 81	198 2 - 86	198 7 - 91	199 2 - 96	199 7 - 00	200 1 - 03
Measure and Pay	55	50	58	50	64	72
Lump Sum	12	10	8	7	10	5
Prime Cost	10	8	5	4	3	1
Design and Build	22	31	28	35	21	22
Management Contracting	1	1	1	1	1	0
Joint venture	0	0	0	3	1	0
Total	100	100	100	100	100	100

6. FACTORS AFFECTING THE CHANGE IN USE OF PROCUREMENT SYSTEMS

As the industry's characterization is determined by the external environment (political, economical, technological, financial, social, etc.,) in which it operates, the development and the use of procurement systems are also affected by such environmental factors (Rowlinson, 1999). These environmental factors influence the industry in various ways thus determining the procurement shares and trends. How the influences of these factors are directed towards procurement trend in Sri Lanka is discussed below.

6.1. Economic Market and Financial Aspects

Cyclical demand in the construction industry is caused by the economic status of the country. Moor (1984) highlighted the decrease in construction work load in 1970's, due to the recession in UK, which resulted in contractors diversifying into areas of design and management to ensure adequate work for survival. Such situations have resulted in the growth of new arrangements such as Design and Build and Management Contracting in UK construction industry. Further, in UK, the oil crisis in 1970's, which resulted in high inflation, coupled with high borrowing rates made the client realise the essence of construction time and gave rise to fast track project procurement arrangements like Management Contracting. In examining the share of project procurement arrangements used from 1987 – 1997, Ladenpera, et.al. (1999) stated that the changes in economic conditions may have had an impact on project procurement arrangements used in Finland. In Finland, economic boom in the end of 1980s was followed by a sharp decline of over 50% of the construction workload within three years. In 1996-97 volumes started to grow again. The traditional method seemed to be the choice especially in the recession in early 1990s with a low market structure. As the economy revived in 1996-97, the shares of Design and Build and Management oriented

procurement systems increased possibly due to the need for shorter project duration (Ladenpera et. al, 1999).

In Sri Lanka, with the market changing from closed to open economy in 1977, there has been a tremendous increase in construction workload (see Figure 1). This had resulted in a considerable increase in the use of non-traditional forms of construction project procurement arrangements. The share of non-traditional procurement systems increased from 23% to 32% in the 1982-86 period compared to the previous one. Such a change was due to the burning requirement for faster implementation of projects and increased involvement of foreign contractors and consultants in the industry. Similarly, the rise of non-traditional systems could be observed in the 1992-96 period. The share has increased up to 39%. In both these periods, Design and Build constitutes the largest share among the non-traditional systems. The study found that Design and Build is mainly used for industrial buildings especially for pre-fabricate type of constructions. Thus, the increase of Design and Build could be attributed to the increase in industrial activity in the country. The growth of the manufacturing sector as shown in Figure 2 has resulted in an increase in the share of Design and Build, especially during 1982-86 and 1992-96 periods. During both these periods the manufacturing value added recorded a peak growth rate of more than 8%.

In examining the organizational structure of Japanese contractors operating in Sri Lanka Rameezdeen and Welaratne (2001), found that all Japanese contractors have entered the Sri Lankan market through Joint venture procurement arrangements. Joint venture provides an opportunity to reduce the cultural gap between the international contractor and the host nation, in addition to numerous other advantages to the newcomer. Even a minute share of Collaborative systems during the periods of 1992-96 and 1997-2000 are due to the involvement of international contractors in Sri Lanka.

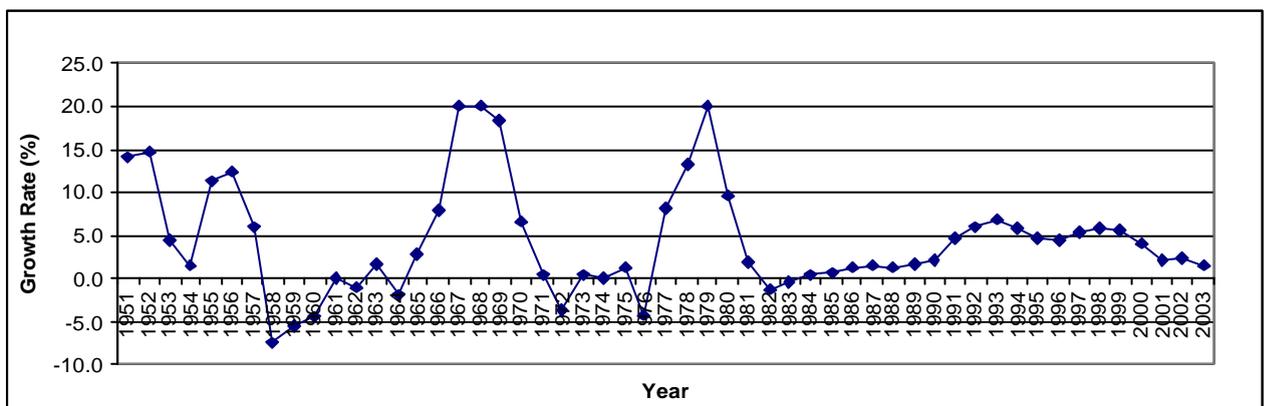


Fig. 1. Growth Rate of Construction Value Added at Constant 1996 Prices (3 year moving average)

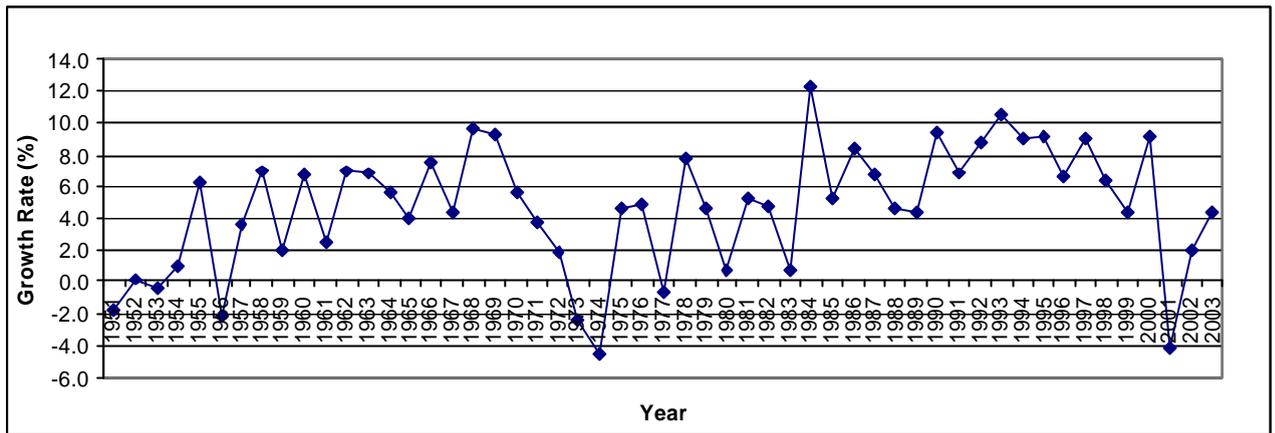


Fig. 2. Growth Rate of Manufacturing Value Added at Constant 1996 Prices (3 year moving average)

Most developing countries frequently obtain finance for major development projects through development aid funds. Both bi-lateral and multi-lateral aids constitute a major portion of the development budget of Sri Lanka. These lending institutions essentially safeguard their interests by dictating the methodologies that the borrowers should follow. The procurement route is one such area where their advice is focused. For example, if the project is funded by World Bank or Asian Development Bank, the procedures for procurement will be according to their whims and fancies. Thus, the issue of client's choice in the procurement becomes secondary to the perceived benefits of financial arrangements.

It is also observed that many arrangements for transactions between client, contractors and financiers have evolved in recent years. In a situation where client has no financial resources, projects are implemented through procurement arrangements such as BOT, BOO etc. These have caused new financial structures and also have led to a change in project procurement practice in the construction industry.

6.2. Government as a Client

The Government is an important participant in the construction industry of every country playing the role of a major client (Ofori, 1990). De Valance and Huon (1999) and many other researchers (Mustapha, *et. al.*, 1994; Mukalula, 1996; Azis and Ofori, 1996) have stated that changes in state regulations and policies have made an impact on the procurement trend. Further, some governments directly influence the project procurement through their policies. It is the stated policy of the government of Sri Lanka to procure future investments for new infrastructure projects through various forms of Concession Contracts (especially BOT or BOO). By such policies, Government expects to provide solutions to the problem of insufficient funds for investment (Presidential Policy Statement: Sri Lanka, 1996). Government being a major client creates an impact on the construction market, thus indirectly regulating the project procurement practice in a country. In Sri Lanka, majority of public works are procured using Measure and Pay system. The reluctance of the public sector to use other non-traditional procurement methods is due to the bureaucratic barrier created by financial and administrative regulations of the country. Among others, transparency and public accountability are very important requirements in public work projects. Transparency in procurement can be defined as “the extent to which construction procurement is conducted in an open, clear, measurable and verifiable manner”. Transparency shall ensure that there is a fair competition in the tender process and the government purchases best value for money (Rogge, 2003). Transparency involves following key elements (World Bank, 1995):

Notification and advertising; Pre-disclosure of relevant information; Public bid opening; Use of standard bidding and contract documents; Accessibility of applicable laws and regulations; Appeal mechanisms; Debriefing; and Publication of awards.

Transparent systems have clear procedures for public decision-making and open channels of communication between stakeholders and officials and make wide range of information accessible. Open processes according to general rules subject to monitoring regarded as the basis of accountability. As the funds for public sector projects are channeled through the Treasury, accountability is considered a major requirement. Accountability is the “Responsibility for the justification of expenditure, decisions or the results of the discharge of authority and official duties”. Measure and Pay procurement method ensures both transparency and accountability compared to any other method. As such, bureaucrats prefer Measure and Pay over other methods for public sector projects. It is interesting to note that 100% of the public sector projects in the sample had been procured using Measure and Pay method.

6.3. Government as Regulator

The Government is not only a major client but also the regulator and the administrator of the development of the industry. The Ministry of Finance is responsible for public works procurement administration in Sri Lanka. All government agencies follow the Finance Ministry guidelines in procurement of works, goods, and services. These guidelines form several published documents. Minor changes are communicated through circulars directed at various government agencies. The construction regulatory authority in Sri Lanka, Institute for Construction Training and Development (ICTAD), also publishes guidelines specially aimed at the construction industry. Unfortunately, both the Ministry of Finance and ICTAD take into account only public works in preparation of these procurement guidelines. The documents are highly biased towards Measure and Pay, even though; these guidelines are widely used by the private sector as well.

Very little effort has been taken by the ICTAD to promote other procurement methods in Sri Lanka. Only as lately as year 2001, ICTAD published a guideline called “Standard Bidding Document for Procurement of Works – Design and Build Contracts”. This is the first and only guideline to be published by ICTAD for an alternative procurement arrangement.

A Content analysis carried out on all published documents of Ministry of Finance and ICTAD proved the above observation. Content Analysis is a research tool used to determine the presence of certain words or concepts within texts or sets of texts (Weber, 1990; Holsti, 1969). Table 5 provides the summary of the results of content analysis.

Table 5. Frequency of Themes on the Selected Variable Categories

Variable category	Frequency
Measure & Pay	31
Lump Sum	1
Design and Build	3
Management Contracting	1
Total	36

Out of the 36 references on procurement methods, only 5 belong to non Measure and Pay methods. It shows that government guideline mainly promote Measure and Pay as the procurement method in Sri Lanka. Therefore, the dominance of Measure and Pay in Sri Lanka is mainly attributable to the institutionalisation of this procurement method by the Government and virtual negligence of other methods over time.

6.4. Socio-cultural Aspects

Hofstede (1984) has maintained that the concept of culture is a prime driver of both individuals and organizations. Trust and institutions are two major dimensions related to culture. Latham (1994) accepted 'trust' as the gatekeeper to any real progress in improving procurement and contractual relations in the UK construction industry. His report attempted to rebuild the trust in UK construction industry through the advocating of partnering and encouraging restructuring of client, contractor, subcontractor, supplier and consultant institutions. The importance of institutions in establishing procurement policies and practices are well established by many researchers (Ng, 1994; Ofori and Pin, 1996; Azis and Ofori, 1996). Analysing the relationship between procurement system and clients interests in both countries, Saito (1994) made clear that procurement difference in UK and Japan is based on cultural differentiation. Western organisations may need to learn to work with Asian professionals by accepting their cultural composition (Matthews *et. al.*, 1999).

Rameezdeen and Gunaratne (2003) found that the separation between design and construction dates back to the Colonial rule (1815-1948) in Sri Lanka. This split has given rise to two separate cultures between Contractor and Consultant. It was revealed that Consultants are oriented towards a clan dominated culture mix, while contractors towards a market dominated culture mix. Consultants emphasize on loyalty and comfortable working environment. Contracting organizations on the other hand are driven towards output maximization. They encourage on goal accomplishment. Thus, the popularity of Measure and Pay is historical and it became institutionalised in the Sri Lankan society as the method of procurement.

Using the four dimensions of national culture established by Hofstede (1980), Rameezdeen (2004) examined what constitute the Culture of Sri Lankan Construction Professionals. The results show a relatively large Power Distance and a very strong Uncertainty Avoidance among construction professionals. It was found that they are Collectivists and Feminine. The main characteristics emanating from the above culture mix on Procurement selection can be given as follows, based on Hofstede (1980): Fear of ambiguous situations and of unfamiliar risks; Suppression of deviant ideas and behavior; resistance to innovation; Motivation by security and esteem or belongingness; Status quo. Is accepted and not challenged; Dominant role of the state in the economic system; Harmony and consensus in society is highly valued; Dominant values in society are caring for others and preservation; and Resolution of conflicts by compromising and negotiation.

Therefore, it is clear that Sri Lankan construction industry is characterized by the notion of acceptance of the status quo. Changes to accepted systems are very difficult to come about. Thus, the nature of Sri Lankan construction culture itself contributes to the dominance of Measure and Pay procurement method.

7. CONCLUSION

This paper highlighted the dominance of separated procurement systems in Sri Lanka from year 1977-2003. Among the variants of separated system, Measure and Pay had the highest share. It ranged from 50-72% of the total. The popularity of Measure and Pay is mainly due to the Government influence on the construction industry of Sri Lanka. Government as a major client and the regulator neglected the development of alternative procurement methods. Bureaucratic red tape of the Government created a barrier for the growth of alternative procurement methods in the name of accountability and transparency of public work projects. In addition, it was found that the combination of national culture and organizational culture

of construction has created an environment that did not favor the use of new procurement methods. The organizational culture of construction in Sri Lanka is characterized by the separation of design and construction from the Colonial days. The culture of construction professionals is marked by a high power distance with a very strong uncertainty avoidance. The construction professionals are found to be collectivists and feminine. Therefore, this culture mix does not challenge the status quo. Thus, there is no room for new procurement methods to be experimented in the Sri Lankan construction industry. As a result, the Measure and Pay became institutionalized and never being challenged.

However, economic growth has favored some of the alternative methods to emerge in Sri Lanka. Design and Build is one such method, which became popular mainly due to the industrial growth of the country. Industrial buildings were mainly procured using Design and Build method. Joint venture arrangements became popular due to the involvement of international Contractors in Sri Lanka.

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