AN INTERPRETIVE RESEARCH METHODOLOGY FOR ASSESSING THE APPICABILITY OF WESTERN PRODUCTIVITY TECHNIQUES IN SRI LANKA

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The increasing global dominance of neo-liberal economics has served to erode the previously dominant view that the adopted management approach should be dependent upon context. The World Bank and International Monetary Fund often impose the ideology of free-market economics on developing economies. The currently accepted techniques of construction productivity techniques are shaped by this same ideology in that they rely on the concept of capital productivity. The applicability of Western productivity techniques to the labour-intensive Sri Lankan construction industry is therefore debatable. In Sri Lanka, capital intensive as well as labour intensive construction techniques have been employed for several decades. To date there has been little impact on overruns, delays, wastage of resources, labour unrest and low productivity. Although Sri Lankan constructors are well aware of the supposed advantages of Western productivity techniques, they will continue to give more emphasis to labour intensive construction methods because labour is cheap and readily available. A research methodology is described which investigates the extent to which these two approaches can be merged to seek more context-specific productivity goals.

Keywords: needs analysis methodology, productivity, research methodology, Sri Lanka.

INTRODUCTION

It is often assumed that management methods can be applied irrespective of context. This is especially true of Western productivity techniques that are supposedly synonymous with good practice. Such techniques are invariably introduced into developing economies as part of the economic re-structuring imposed by Western institutions such as the World Bank and the International Monetary Fund (IMF). This globalization of economic policy has seemingly eroded previously popular arguments, which linked the appropriate management to context. A further major influence on the declining influence of contingency theory has been the increased interchangeability of management ideas between Japan and the West. Whilst Japanese society remains very different from that of the West, their economies share a common reliance on *capital* productivity. In this respect the Japanese economy differs very little from that of the industrialized West. Indeed, the 'Japanization' of Western productivity techniques and their re-export back to the West has led to a generally accepted model of productivity seemingly irrespective of context (Womack *et al.* 1990). However, in comparison to the Sri Lankan construction industry, the contexts provided by Western and Japanese manufacturing industries seem very similar. The transferability of productivity techniques between the West and Japan therefore provides little confidence that they

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can be further extrapolated to Sri Lanka. This describes the background to an ongoing doctoral research project. At the time of writing, the literature review has been completed and an appropriate research methodology derived. The fieldwork will commence shortly. The purpose of this paper is to summarize the research question and to provide the justification of the adopted research methodology.

SRI LANKAN CONSTRUCTION INDUSTRY

The construction industry of Sri Lanka has a long history of which the country can be justly proud. Unfortunately, the achievements of the past are only evident in the ruins of cities, irrigation structures and other religious edifices. Notwithstanding these past achievements, Ganesan (1992) describes how many factors have combined to limit the capacity of the Sri Lankan construction industry to execute major projects. For instance, there has been a prolonged absence of a consistent policy framework that allows for the advanced planning of construction resources. The institutional capability of the Sri Lankan industry is seriously lacking in this respect. The weakness is evident especially with regard to private contractors and the traditional building materials industry. Furthermore, government economic planning has seldom examined in detail the implications of development plans for the construction sector.

Every major political change has introduced a new set of policies substantially different from the earlier ones. Furthermore, traditional economic thinking failed to recognize construction as a key sector in development. Ill-conceived state policies have too often been aimed at short-term gains, serving only to blur the long-term vision for the development of the national construction industry. However, the new economic strategies developed after 1977 consistently promoted the construction industry as a lead sector in the quest for development. The government's ambitious investment projects gave work to a large number of domestic contractors. This provided an unprecedented opportunity to upgrade the structure and technology of both large and small firms, and also to strengthen their capabilities.

In the early 1980s the Sri Lankan Government, with World Bank assistance, created the Construction Industry Training Project (CITP). The declared objective was to train personnel to 'minimum employable levels' to overcome the acute shortage of manpower which then prevailed in the construction industry. The World Bank credit loan also required the CITP to identify deficiencies that stood in the way of an efficient construction industry. Another important covenant in the first credit loan was the creation of a strong Association of construction contractors. The second World Bank loan in 1986 provided for a wider scope of activities, which was deemed necessary for the development of the industry. The CITP was therefore converted to the Institute for Construction Training and Development (ICTAD) which was provided with a much broader mandate. Both CITP and ICTAD performed to a high degree of acceptance. The credibility of ICTAD is currently so high that it effectively serves as a 'think tank' to advise the government and implement state decisions on all matters related to the construction industry.

MEASURES OF PRODUCTIVITY

A general definition of productivity is the *'relationship between the output generated by a production or service system and the input provided to create this output'* (Wild 1995). This is referred to as total productivity when all inputs and out puts are considered (Derwin 1985). Lema and Price (1996) have stated that, in practice, it is

often difficult to quantify all inputs and outputs of the production process. It is usual therefore, to express productivity as a ratio of output to input for whatever is considered to be the key resource. Common examples would be capital, labour or materials, depending on whatever was considered to be of most relevance. This implies that any operational definition of productivity must be defined in terms of the boundary of the production system, specifying the inputs and outputs which are considered to be of most concern. Thus productivity could be measured in relation to any one factor of production.

Lowe (1987) proposed that labour productivity, although a partial measure of productivity, has been accepted widely as a performance measure in the construction industry in developed as well as developing countries. Halligan *et al.* (1994) and Meluney (1993) further consider that labour productivity has significant advantages given that construction is such a labour-intensive activity, Ganesan (1994) has also added his weight in support of labour productivity. Therefore, even in developed economies, a convincing argument can be made in favour of labour productivity. This is in contrast to the prevailing Western (and Japanese) productivity techniques which focus almost entirely on *capital* productivity. The notion of 'lean production' as described by Womack *et al.* (1990) may well be appropriate for the capital-intensive process of motor manufacturing, but the extension of these ideas to the construction industry should by no means be taken for granted. Whilst it could be argued that the hegemony of capital productivity is mainly due to the non-availability of cheap labour, it would seem that the issue is largely shaped in terms of neo-liberal economic ideology. In developing countries the argument in favour of capital productivity is even less clear-cut.

Productivity in developing countries

Developing countries have traditionally given priority to labour intensive projects. This is not because labour is cheap and readily available, but because such countries do not have adequate capital to venture on capital intensive projects. In developing countries, labour is the critical factor in enhancing productivity. The argument in support of measuring *labour* productivity would therefore seem to be undeniable. Unfortunately, Sri Lanka would seem to have already committed themselves to the alleged relative advantages of capital intensive projects compared with labour intensive ones. The tendency is to impose the same measures of productivity as are applied in the West. This is evidenced by gradual move towards the mechanization of the manufacturing, agriculture and construction industries in accordance with the dominant wisdom imposed by the World Bank and IMF. This is despite the East Asian experience (e.g. Malaysia Thailand, Korea) where the process of industrialization started with labour-intensive technologies and gradually moved towards capital intensive technologies.

From the viewpoint of capital-intensive productivity, the introduction of modern technology is an essential pre-requisite. According to the received dogma, there is therefore little choice between the labour intensive and capital intensive technologies, even for developing countries although labour is cheap and readily available. Moreover, the World Bank and IMF encourage developing countries to allow market forces to operate freely. The rhetoric of free market thinking, liberalization and privatization has replaced the previously dominant Keynesian doctrine of state intervention. In view of such free market thinking, more and more private entrepreneurs will enter the market and endeavour to maximize their

productivity/profits by using modern technology. This will increasingly serve to place more importance towards capital as against labour. Whether this is in the best interests of the Sri Lankan economy as a whole is once again highly debatable.

APPLICABILITY OF WESTERN PRODUCTIVITY TECHNIQUES TO SRI LANKAN CONSTRUCTION INDUSTRY

The inevitable starting point for any modern Sri Lankan engineer is to study technologies developed by their supposedly more illustrious counterparts in the Western World and try to adopt them to the situation in Sri Lanka. However, this blind tendency to follow the Western model denies the uniqueness of the local context. What is required is a more critical assessment of the most *appropriate* construction techniques. The technology that is adopted must suit the requirements of local conditions. The products of the construction industry must certainly be affordable. They must also offer a level of quality that matches up to modern standards. However, broader considerations must also be taken into account. In the Sri Lankan context, the need to conserve national resources, avoid environmental degradation and conserve foreign exchange. Also of paramount important is to improve the quality of life of a significant section of the Sri Lankan population. The issue is therefore one of selecting the 'appropriate technology' which serves a broader social agenda in terms of creating employment opportunities, without unnecessarily compromising on productivity and rates of output.

AIMS AND OBJECTIVES

Research aims

In view of the above the aim of the proposed research is to investigate the assessment of *appropriate* productivity techniques for the construction industry in Sri Lanka. The theoretical basis of Western productivity techniques will be examined with a view to establishing the extent to which they are dependent upon a certain set of underlying economic assumptions. An alternative model of productivity will be developed in accordance with the Sri Lankan context. The alternative model will be further justified in terms of the associated philosophical and sociological assumptions. However, it will also be necessary to recognize the constraints that are imposed on the Sri Lankan industry by the prevailing global order.

Research objectives

Following on from the above, the specific research objectives can be stated formally as follows:

1. To review the theoretical basis of Western productivity techniques and the extent to which they are applicable in the Sri Lankan context.
2. To ascertain and assess the productivity techniques which are currently used in the Sri Lankan construction industry.
3. To develop an alternative model of productivity that balances both labour and capital measures of productivity in a way that is appropriate to the Sri Lankan context.
4. To evaluate the validity of the proposed model in accordance with the needs of different interest groups within the Sri Lankan economy.

SAMPLE AND SAMPLE SIZE

The research will take place within the context of construction projects commissioned by the Port Authority of Sri Lanka (PASL). The PASL is involved in a wide range of construction projects of different types. It is also one of Sri Lanka's major construction clients both in terms of capital expenditure and employment. The constituency for the proposed research is provided by a representative cross section of personnel engaged on PASL projects. The constituency consists of a sample of 150 purposefully selected research participants. The sample comprises a range of diverse interest groups including consultants, contractors, clients, engineers, project managers, foremen, supervisors and labourers. Trade union representatives will also be involved, together with representatives of PASL's senior management. Access has been secured to the Chairman, Director General and four members of the Board of Directors. The above population has been stratified so that the characteristics of the selected research constituency are fairly represented in the sample.

METHODOLOGY OF THE STUDY

The great paradigm debate

The design of any research study begins with the selection of the research paradigm, which is appropriate to the selected topic (Creswell 1994). The word 'paradigm' is undeniably over-used in popular management parlance. Nevertheless, it is of fundamental importance for a researcher to be self-aware of the assumptions that lie behind the adopted theoretical position. Much of the recent debate on research methodology within the construction management community stems from the controversial paper by Seymour and Rooke (1995). Nevertheless, a rich understanding of the issues involved can only really be understood by referring to the broader literature on research methodology that lies beyond the domain of construction management. Any such discussion should begin with reference to the seminal work on social theory by Burrell and Morgan (1979). Whilst the debate is often characterized in terms of the merits of quantitative research *vis-à-vis* qualitative research, this fails to capture the complexity of the underlying issues of concern. Burrell and Morgan (1979) argue that the key assumptions that characterize different approaches to social theory can be analysed in terms of two dimensions. The first is the subjective-objective dimension. The second spans between the 'sociology of regulation' and 'sociology of radical change'. These two dimensions combine to create four distinct sociological paradigms, labelled functionalist, interpretive, radical humanist and radical structuralist. The essence of Seymour and Rooke's (1995) argument was that construction management research has to date been overwhelmingly dominated by the functionalist paradigm. This remains broadly true, despite an increasing number of researchers working within the interpretive tradition (e.g. Loosemore 1999). There have also been some isolated recent examples of research developed within the radical humanist tradition (Green 1998). Whilst the development of a critical perspective in construction research may be useful in terms of exposing propaganda, it is less useful in determining an alternative way forward.

Much of the research methodology literature refers to the importance of 'matching' the appropriate research paradigm to the nature of the problem. This is certainly true for the most obvious cases. For example, it would be ridiculous to advocate an interpretive paradigm for research into inter-planetary motion. However, within social contexts, it must also be recognized that different research paradigms are associated

with different values. The value-laden nature of research is perhaps at its most obvious with work written from the radical-humanist standpoint, which invariably provokes an angry response from those who adhere to the scientific tradition. However, at least writers such as Green (1998) display a self-awareness of their adopted theoretical position. This is often not true for those who fall unthinkingly into the functionalist paradigm due to a subconscious allegiance to 'scientism'. It is important to recognize Burrell and Morgan's (1979) contention that their four paradigms are ultimately mutually exclusive. Within the context of social theory, it is therefore impossible to say that any one paradigm is superior to any other. The key issue for the researcher is to be critically self-aware of his or her adopted theoretical position. It is also important to ensure that the adopted research methodology is internally consistent.

SELECTED RESEARCH PARADIGM

In terms of selecting the appropriate research paradigm for the proposed study, the choice was quickly narrowed down to the interpretive and functionalist paradigms. Whilst the importance of the critical perspective is acknowledged, this was felt to be too risky for doctoral research within the context of a conservative construction management academic community. Perhaps more importantly, the values of the radical perspective were not felt to be compatible with the personal values of the researcher. The view is taken that change is best implemented in an incremental fashion. Nevertheless, it is accepted that this is a value-laden decision and that others might feel more comfortable with a more radical approach. Ultimately, the researcher is able to exercise free choice provided that the supporting argument is persuasive.

The argument in support of a qualitative methodology, shaped by the assumptions of the interpretive paradigm, is well rehearsed in the literature. Lancy (1993) noted that for quantitative studies the research problem tends to evolve from the literature. This of course depends upon the existence of a substantial body of literature on which the researcher can build. Variables are known, and theories may exist that need to be tested and verified. But for the proposed study the research problem needs to be explored because little information exists on the topic. There is no robust theoretical base to guide the study because those available are inadequate, incomplete, or simply missing. On the basis of an extensive review of the literature, the proposed research is considered exploratory in nature. This therefore leads inevitably to the interpretive paradigm as the most appropriate framework within which to develop an appropriate research methodology.

The focus of the proposed research will be on participants' perceptions and experiences, and the way they make sense of their lives (Fraenkel and Wallen 1990). Interpretive researchers take the view that reality is socially constructed. They therefore seek to delve into human consciousness and subjectivity in their quest for the fundamental meanings which underlie social life. The premises of the interpretive paradigm question whether organizations exist in anything other than a conceptual sense. Its significance for the study of organizations is therefore of the most fundamental kind. It challenges the validity of the ontological assumptions which underwrite functionalist approaches to sociology in general, and the study of organizations in particular (Burrell and Morgan 1979). In the context of the Sri Lankan construction industry, it is clear that there is no 'objective truth' in terms of how productivity should be measured. The issue of importance is to derive an approach, which is meaningful to the participants.

RESEARCH TECHNIQUES

The preceding discussion provides the justification for a research method that accords with the interpretive paradigm. At the time of writing, the derivation of the research method and associated techniques remain tentative. It is envisaged that the adopted method will comprise a range of techniques, including the use of participant observations, interviews, questionnaires and the review of documentary evidence. Each technique is designed to get certain type of information. For example, under certain circumstances, participant observation can determine what people do or what events happen. In contrast, questionnaires and interviews determine what people say they do. According to Kane (1977) different research techniques should be used to complement and support one another. No one technique can ever duplicate exactly the functions of the rest. Each technique yields information that only it can obtain, but it also reinforces the other techniques. In the proposed study, it is intended to use as many techniques as possible to examine the same data through different strategies. This will serve to verify and strengthen the validity of the research results. Additionally, a separate instrument known as 'Productivity Needs Analysis Methodology' has been developed following Hutchinson and Coffing (1971).

PRODUCTIVITY NEEDS ANALYSIS METHODOLOGY

Many assessment methodologies have been developed and implemented over the past 30 years in many countries (Rae 1986). The researcher has reviewed an extensive literature on such methodologies and has decided to adapt the 'needs analysis methodology' originally developed by Hutchinson and Coffing (1971). This is considered to be the most useful methodology of all found in the literature, mostly because of its emphasis on the definitions of needs based on exact responses of the population directly concerned (Nanayakkara 1996). The field research pertaining to the needs assessment will commence in November 1999. The needs assessment instrument will be administered to 150 sample respondents, as previously described. Space precludes a complete description of the proposed procedure. The following description is therefore by necessity brief and selective.

Data collection and prioritization procedure

As the first step in the needs assessment exercise, the researcher will explain the purpose of the needs analysis methodology together with the procedures to be followed. An initial 'stimulus question' which will require each respondent to imagine an ideal situation in which their productivity needs are fully met. Visualizing this situation, the respondents will be requested to write down everything they think would be of importance. Their responses will be carefully collated into individual attributes (components) of the general need. Such need definitions will be prioritized by fifteen people knowledgeable in both Western productive techniques and the management of labour intensive construction projects. This process will elicit the ten most important attributes, which will provide the focus for the subsequent stage of the research process.

Operationalization of the prioritized attributes

The second major phase of the research will be the operationalization of the ten prioritized items obtained from the need analysis. This will be done in order to elicit clear statements about the most important need definitions as given by the participants. This is considered essential in order to provide more useful and valid

information regarding the relevant attributes of the Sri Lankan construction industry. This aspect of the research will be carried out in the form of facilitated focus groups in which the participants will be asked to respond to the oral instructions of the research assistant. A panel of fifteen judges outside the sample will participate in this phase of the research in groups of five each.

The major assumption underlying the operationalization process is that the resulting statements would enable further clarification of the needs of the construction projects. These statements can then be used as the basic framework for developing construction projects applying Western productivity techniques in the control of labour intensive construction projects in Sri Lanka. As a first step, the participants will be given a written statement of the first prioritized item from the earlier tabulation of the need definition. After reading the written statement, they will be asked to construct in their minds a hypothetical situation, which should be as real and complete as possible. The participants will be asked to visualize in their minds a construction project which is capable of effectively controlling/managing labour intensive construction projects by using Western productivity techniques.

The participants will be asked to examine the hypothetical situation, to observe it very carefully and to write down all the things that he/she could see in the project, all the things indicating that the above quality is present. The participants will be advised to write down the items in a list, not putting down just one or two things, that came to mind, but getting everything possible by exhausting the hypothetical situation to an ultimate degree. This process will be repeated for all the prioritized items in the earlier needs analysis with different groups of participants. At the end of the process, the researcher will collate all the dimensions of each prioritized item in separate lists, after checking for duplications and irrelevant items. The purpose of the whole operationalization procedure is to identify all the dimensions that the researcher could get for each attribute. This procedure will help to make the list of dimensions as complete as possible and provide a very good approximation of the number of dimensions that the researcher could have in order to address the objectives of the study.

SUMMARY

This paper reports ongoing doctoral research into the applicability of Western productivity techniques to the construction industry of Sri Lanka. The currently popular productivity improvement techniques have been analysed and critiqued in terms of their underlying assumptions. Of particular note is the way in which such techniques are derived from the Western experience of capital intensive construction projects, rather than the labour intensive construction projects that tend to prevail in Sri Lanka.

The purpose of the research is to challenge the widely held assumption that Western productivity improvement techniques remain meaningful when transferred to the context of a developing country. A methodology as been derived that is compatible with the interpretive paradigm. The research is primarily based upon a mixed methodology which combines participant observation, semi-structured interviews, documentary analysis and questionnaire surveys. Additionally, a separate instrument known as ‘Productivity Needs Analysis Methodology’ has been incorporated. This approach is justified on the basis that it allows for the definition of needs based on the responses of the population directly concerned, rather than those imposed by external interests. The need definitions so obtained will be prioritized to obtain the ten judged

to be the most important. These will be further operationalized by means of a series of facilitated focus groups involving the various different parties within the Sri Lankan construction industry.

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