KEY INFLUENCES ON PROJECT IDENTIFICATION IN BUILDING PROJECTS IN UGANDA

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The construction project is characterised by sequential phases, each of which contributes to the final attributes of the project. The efficient management of a construction project must therefore start with its first phase, the project identification phase. Effective management of the phase requires that the importance of factors associated with the inputs, interaction process and outputs, be known. These factors and their relative importance are environment specific.

This paper introduces a methodology of identifying and arriving at consensus about the importance of key factors associated with inputs, interaction process and outputs of the project identification phase. The method involves initiating a search, and systematically extracting the data, from a carefully selected source. A Delphi technique procedure is then used to ensure convergence of opinion based on the participants' successive interaction with information from their environment. The paper demonstrates the employment of the methodology with a sample of one hundred building projects in Uganda. This specific example paves the way for the design of better and effective management procedures in a bid to optimise operation at organisational and industry level in Uganda. The paper identifies the influential factors during the project identification to allow for better decision-making.

Keywords: Construction project, project identification, consensus, Delphi technique.

INTRODUCTION

Construction projects are characterised by sequential phases through which they pass to reach their objectives. Each of the phases contributes in a unique way to the final attributes of the project. Good performance at the project level is dependent on the efficient management of each phase. Unfortunately, the project management concept is traditionally too often understood and applied in a way that does not introduce a systematic and well-structured project identification phase. Historically, project management and planning have been very much project-realisation-oriented. There seems to be a pre-supposition that an already existing project demands attention in terms of its realisation. Thus, little, if any, attempt has been focused towards the project identification phase. There is urgent need to move from this stance and take a more pragmatic approach and manage construction projects through all the phases.

The first half of the 1990s saw increased awareness about the importance of the project identification stage of construction projects (Kähkönen 1996). Based on his experience for example, Morris (1988, 1994) found that most of the factors explaining the success or failure of construction projects can be traced back to the early stages of the project, especially the identification stage. There is sufficient evidence indicating that good management of the project identification phase is vital for subsequent proj-

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ect success or failure. The first step in the efficient management of a construction project must therefore start with the efficient management of this phase.

THE PROJECT IDENTIFICATION PHASE

Building project identification, in this paper refers to all those activities undertaken within an organisation in initiating a construction project up to, but excluding the feasibility study stage. It involves recognition of the need for a facility and development of a commitment to satisfy the need. A well-executed project identification phase encompasses a careful definition of the user requirements for the conceived facility and relates the requirements to the available technology, resources and inherent risks.

At the end of the project identification phase, it should be decided whether a feasibility study should be undertaken. If the decision is to proceed with the feasibility study, the project objectives and the ground rules for the study should be defined. More often than not, construction projects experience difficulties because the importance of the identification phase is underrated.

The construction project identification phase should also involve definition of relevant constraints which may include budget, time, technology (tools, personnel and procedures), market, competition, government policy, social, environmental issues and others. The constraints need to be stated with or implied in the project objectives, otherwise the project could conceivably be developed in a way that violates a cardinal limitation.

THE PROJECT IDENTIFICATION PHASE AS A PROCESS

The project identification phase can be seen to be a process in which various inputs through interaction, produce outputs as illustrated in Figure 1 below. The inputs into the process include human resources, data and pre-defined priority schedules or influence. These inputs interact using equipment such as computers at various frequencies and for various durations. Different procedures and rules, some of which may be aimed at optimisation or simply satisfying pre-defined requirements, are used.

All the above operate under a specific approach to decision making which may be rationality, bounded rationality, politics and power or simply a random confluence of events (Einsenhardt and Zbaracki 1992). During the interaction, decisions are made at different stages and their by products are consensus, conflict and decision quality (Amason 1996). The outputs include project objectives and constraints. The contents of the inputs, interaction and outputs sets vary from environment to environment and must be clearly defined with their respective relative importance if the project identification phase is to be well managed. This calls for knowledgeable personnel, preferably with some professional assistance, to be involved in the activity of identification of the factors and their relative importance if a realistic out come is to be obtained.

RESEARCH METHODOLOGY AND STRATEGY

The phase research methodology (Kervin 1992) is used to refer to definition of the basic research design and data source. The methodology adopted for any research is dependent on the nature of the research. In this paper, the challenge is to identify key factors and their relative importance in an area that has hitherto received little, if any, attention. This is a descriptive task for which surveys and available data studies are the best effective methodologies (Kervin 1992).

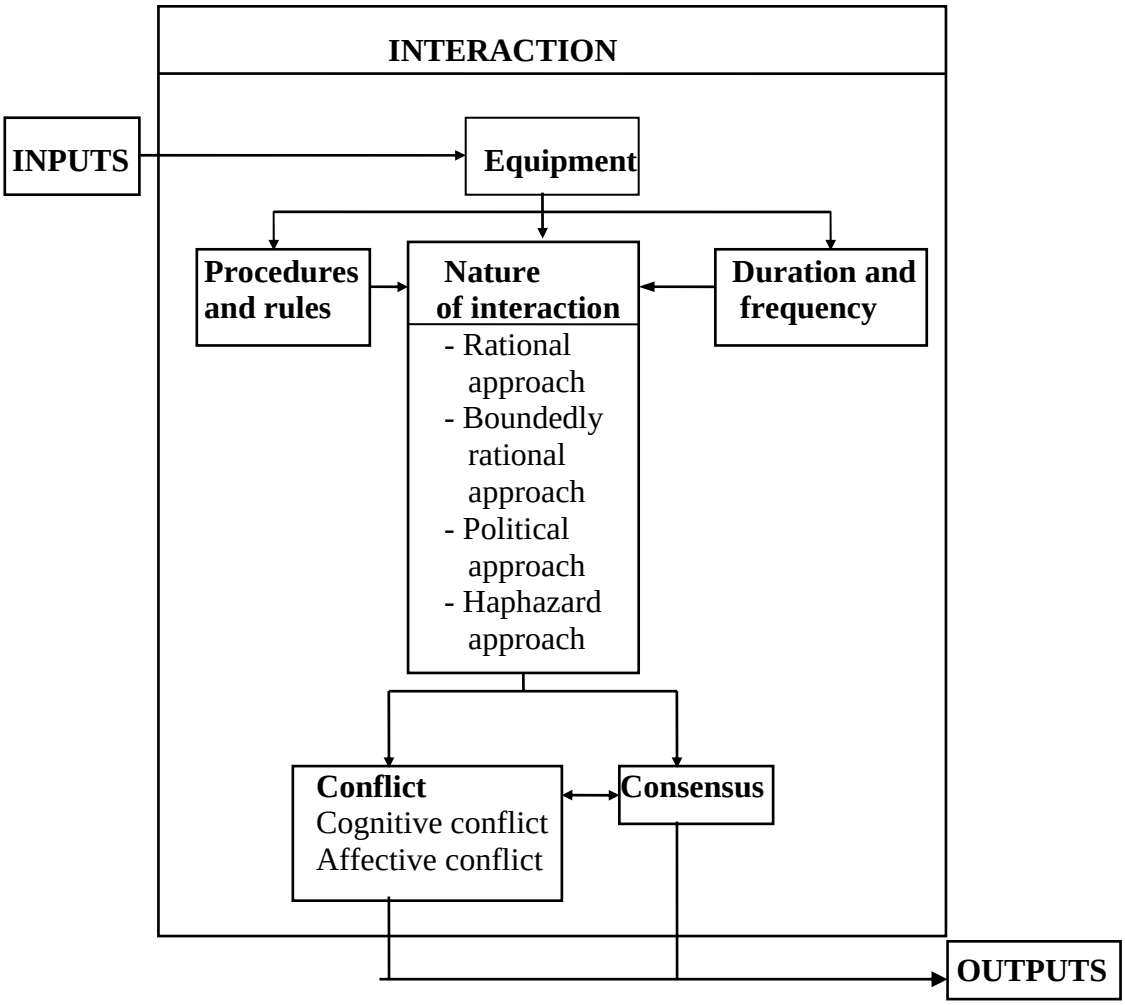

Figure 1: Process diagram for the project identification phase

Unfortunately, available data studies, which could have been probably cheaper to carry out, cannot be done because of the lack of documented data. This leaves one option, to carry out a survey in order to extract the required information. Surveys typically involve non-experimental designs and self reports from a sample of cases.

For descriptive research, accuracy is very important. As far as accuracy is concerned, surveys are advantageous in two ways; first they give the best population estimates for specific variables and groups and second, the overall validity ranges from moderate to high (Kervin 1992, Oppenheim 1992).

When dealing with surveys however, two major concerns namely cost and data quality have to be addressed. The problem of cost can best be handled by pre-coding. The practice makes it possible to input the data into the computer directly from the questionnaire or interview schedule, thus avoiding the intermediate step of coding forms. Hence minimising the cost. The problem of data quality can best be addressed by pre-testing. Pre-tests should be conducted to address question form and content, the overall instrument and other survey procedures. This helps reduce measurement error and non-response (Kervin 1992).

Once designed and executed carefully, surveys provide an opportunity to satisfy the requirement of accuracy in descriptive research. A survey is therefore the recommended methodology for the research into the elicitation of key factors and their relative importance in the construction project identification phase.

The objective of the research into the elicitation of key factors and their relative importance in the construction project identification phase, just like any descriptive research, is accuracy. To maximise chances of achieving the objective, there is need to:

- have a high response rate;
- control the measurement situation;
- have the capacity to assess the extent of non-response bias; and
- appreciate that the topic is considered sensitive and complex by many.

When the above factors are used as criteria for selecting the best strategy for the survey, the personal interview scores much higher than the other two possibilities namely, questionnaire and telephone interview. This suggests that the use of a structured personal interview is the best strategy, when tackling the question of the elicitation of key factors and their relative importance in the construction project identification phase.

The project identification phase is an area about which very little has been done and is known. It is also an area where opinions vary from organisation to organisation and individual to individual. To be able to define common factors in this phase, some interaction is necessary. In their activities, managers tend to base themselves on a combination of past experience and available data. In the absence of documented data, independent interaction with their peers is a suitable alternative and the Delphi technique is the method that can be used to ensure adequate independent thought about issues, on the basis of what other people in the field perceive.

The technique is based on the principle of convergence of opinion or a consensus generated by successive interactions of information exchange within a group of carefully chosen experts individually answering the questions framed. The objective of the method is to reduce the inter-quartile space to establish the median response more clearly (Kumar and Ganesh 1993). The technique can be applied in identification of key factors in the identification phase of the construction project.

In general therefore, the proposed methodology involves initiating a search, and systematically extracting the data, from a carefully selected source. A Delphi technique procedure then follows to ensure convergence of opinion based on successive interaction with information.

Step 1

The first step involves the definition of realistic components of each of the input, interaction and output sets which when raised will trigger a ‘reaction’ in the minds of the people (data source). This allows them to begin searching their minds and bringing to light the different factors and their relative importance. The components need not be exhaustive, but they have to be realistic, otherwise, they will inhibit the reaction and the whole process will break down. Relevant literature and reconnaissance surveys are useful in the accomplishment of this stage.

The step also involves the selection of the data source. The quality of the outcome of this study depends on the knowledge and experience of the data source and their general awareness of the state-of-the-art in project identification practice. It is therefore important that the data source be carefully selected. It is useful to consider the people who have been involved in project identification during the period in

question because these have hands-on experience and improve the reliability of the data collected. Sampling or enumeration (if possible) of the organisations that have had projects initiated is a ideal procedure. Special care must be taken here to get committed people, because the procedure is a multi-stage one and there is need to keep with one set of people throughout the procedure. It may be useful to inform them in advance about this in order to maximise the chances of going through the procedure with a constant number of respondents.

The stage also involves the determination of the research instrument to be used. This may well be influenced by a number of issues including accessibility, cost and time constraints. The best approach in this particular situation is the use of pre-arranged face to face interviews with a well designed interview schedule and show cards to ensure that both the interviewer and interviewee are talking about the same things during the interview (Oppenheim 1992).

In the case study, a sampling frame list of 2320 building projects, was obtained from the Kampala City Council Planning Office. With the sampling frame list, random sampling procedures were employed using a table of five digit random numbers (Kervin 1992) to draw the sample of 100 cases.

From literature review and pre-tests conducted with research students, research assistants and MSc students in the School of Civil Engineering, University of Leeds, an interview schedule, illustrated in Figure 2, was prepared for the task of data collection. The interview schedule, prepared was accompanied by show-cards to ensure clarity. All this was in preparation for pre-arranged interviews.

1. What are the importance ratings of each of the following inputs of the project identification phase?

Factor	**Rating**
Human Resource	
Data (Information)	
Pre-defined Priority Schedule	

2. Please list below other inputs of the project identification phase and their respective importance ratings.

Factor	**Rating**

Figure 2: Extract from an interview schedule

Step 2

The second step involves the collection of the initial information. The use of the interview schedule here is very important. It must have been designed to have the interview conducted set by set, during which questions are asked about inputs, followed by interaction and lastly outputs. The questions must begin with the earlier identified 'triggering off' factors followed by the 'search factor' questions. A rating scale represented on one of the show cards should be used in answering the questions.

Once all the information has been gathered, an analysis follows. In this analysis, the quartiles and inter-quartile space are calculated for each of the questions. A 'box-and-whisker' plot is drawn using the quartile values. This gives a graphical display of the centre and variation of the data set (Weiss 1995).

In the case study, the first task was to introduce the topic of study by the interviewer to the interviewee. This proceeded by use of show cards. Of all the interviewees, 91% were chief executive officers in their organisations and the rest were senior managers. The interviewees were asked to use the rating scale, illustrated in figure 3 in giving their importance ratings. For each of these factors, the first, second and third quartiles were obtained and the inter-quartile range for each of the factors calculated.

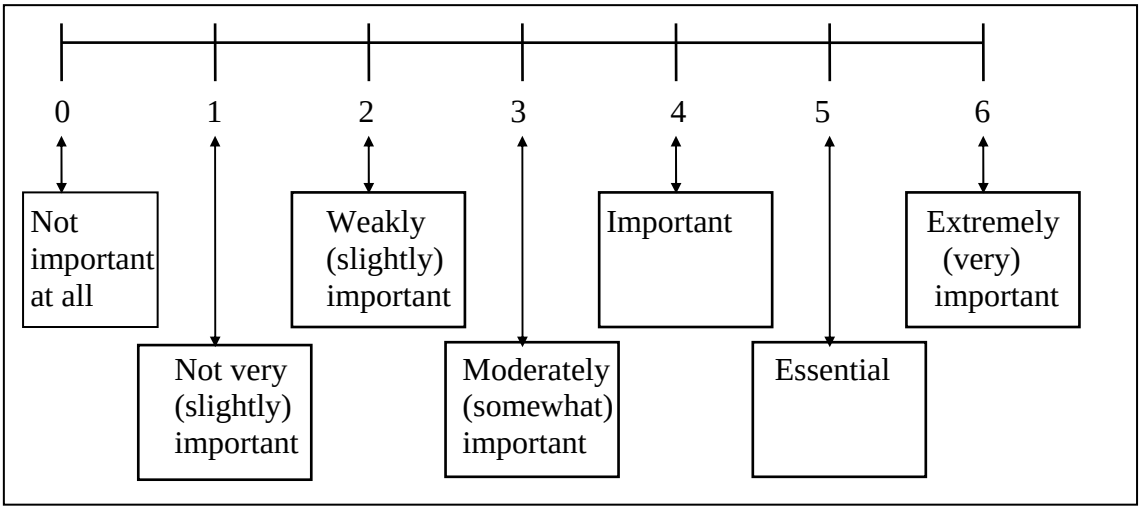

Figure 3: Importance rating scale

The inter-quartile range was used to divide the factors into two groups namely;

Group 1 Factors with Inter-quartile Range = 0; and

Group 2 Factors with Inter-quartile Range ≥ 1.

Step 3

This step involves rethinking the factors and their relative importance by the interviewees and possible adjustment for a homogenous response (consensus). The supplementary interview schedule is specific for each interviewee. It should show the factors, median ratings, own ratings and ask for adjusted ratings (if any) and comments. After all the responses have been got, the data is re-analysed to get the new quartiles and inter-quartile space and new box-and-whisker plots. The two sets of box-and-whisker plots are used to compare the two data sets. If there appears significant changes, a second supplementary interview schedule, similar to the first one is prepared and presented for possible readjustment and comments. The analysis and comparison described above are repeated and the process continues until there are no more significant changes on the ratings, a sign that consensus has been achieved.

In the study, a schedule, illustrated in Figure 4, was prepared to cover all factors in group 2 for each of the respondents who had indicated willingness to participate further during the first interview. With the schedules, each respondent was

approached and reminded of the topic with the use of the previous show cards. For each of the factors, the three quartiles were read to the interviewee and his/her old rating too. He/she was then asked to think about his old rating in relation to the general opinion as represented by the three quartiles and either modify or leave his/her old rating intact and give reason(s) to justify his/her action. The second series interviews yielded a few changes in the importance ratings which did not significantly alter the quartile values. It was therefore taken that consensus had been achieved for all factors.

Factor	**Importance Rating**			**Comments**
	Median	Original	Adjusted	
1.				
2.				

Figure 4: Specimen of supplementary interview schedule

Step 4
The last step in the procedure involves examining the median ratings and categorising the factors into five groups guided by the criteria laid down in the Table 1 below.

Table 1: Criteria for classification of key factors in the project identification phase

MEDIAN RATING, (MR)	**Factor Category**	**Description**
$5.5 \leq MR \leq 6.0$	A	Very Important Factors
$4.5 \leq MR < 5.5$	B	Essential Factors
$3.5 \leq MR < 4.5$	C	Important Factors
$2.5 \leq MR < 3.5$	D	Moderately Important Factors
$1.5 \leq MR < 2.5$	E	Weakly Important Factors

RESULTS

In the case study, the following were the key factors identified with their importance classification.

A: Very Important Factors

Input Factors:
- Human Resource
- Academic Qualifications of Team Members
- Size of Team
- Experience of Team Members
- Data Used
- Type of Data
- Sources of Data
- Pre-defined Priority Schedule
- Source of Priority Schedule
- Implications of Non-Adherence to Priority Schedule

Interaction Factors:
- Frequency of Meeting
- Duration of Meeting
- Approach to Decision Making
- Cognitive Conflict

	Consensus
	Procedures and Rules
Output Factors:	Project Objectives
	Clarity of Project Objectives

B: Essential Factors

Input Factors:	Data Detail
	Accuracy of Data
Interaction Factors:	Equipment Used
Output Factors:	Comprehensiveness of Objectives
	Draft Finance Plans
	Clarity of Draft Finance Plans
	Comprehensiveness of Draft Finance Plans
	Draft Time Schedules
	Clarity of Draft Time Schedule
	Comprehensiveness of Draft Time Schedules
	Comprehensiveness of Constraints
	Clarity of Effects of Constraints

C: Important Factors

Input Factors:	Position in Organisation
Output Factors:	Viability of Project Objectives
	Project Constraints
	Architectural Sketches
	Clarity of Sketches
	Comprehensiveness of Sketches

D: Moderately Important Factors

Input Factors: Expertise of Team Members

CONCLUSIONS

This paper has introduced a methodology of identifying and arriving at consensus about the key factors associated with the inputs, interaction process and outputs of the project identification phase and their relative importance.

In the case study, there are concerns about the positions of some of the factors like expertise of team members, project constraints and others. The positions could well explain some of the characteristic loop holes in the building sector in Uganda.

With the factors and their relative importances identified, quantitative studies can be conducted to establish cause and effect relationships. The factor categories of consideration will depend on the cost of the studies and the required accuracy. The relationships are useful in the design of better management procedures because from them one is able to tell what is required in order to achieve given levels of output and make decisions accordingly. The relationships accord the manager the ability to answer the ‘what if’ questions which are necessary for portfolio and sensitivity

analysis which are some of the major areas of concern for today's complex business environments.

REFERENCES

Amason, Allen C. (1996) Distinguishing the effects of functional and dysfunctional conflict in strategic decision making: resolving a paradox for top management teams. *Academy of Management Journal*, **39**(1), 123-148.

Einsenhardt, Kathleen M. and Zbaracki, Mark J. (1992) Strategic decision making, *Strategic Management Journal*, **13**, 17-37.

Kähkönen, Källe (1996) Multi-character model of the construction project initiation process. *Procs Organisation and Management of Construction; Shaping Theory and Practice*. **1**, 268-277.

Kervin, John B. (1992) *Methods for business research*, London; Harper Collins.

Kumar, Suresh S. and Ganesh, L.S. (1993) Delphi technique for locality specific S & T planning. *Journal of Scientific and Industrial Research*, **52**, September, 595-598.

Morris, P.G.W. (1988) Initiating major projects- the unperceived role of project management. *Procs 9th International World Congress on Project Management*, September, Glasgow, UK, **2**, 801-813.

Morris, P.G.W. (1994) *The Management of Projects*, London; Telford.

Oppenheim, A.V. (1992) *Questionnaire design, interviewing and attitude measurement*, Pinter Publishers.

Weiss, Neil A. (1995) *Introduction to Statistics* NY; Addison-Wesley.