

ENHANCING COST ADVICE OF PUBLIC SECTOR CLIENT ORGANISATIONS BY FORMALISING BUILDING PRICE FORECASTING PROCESS

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ABSTRACT

Public sector procurement laws require that building price forecast be established in-house at construction project initiation. This has often posed problems of performance most times due to poor budgeting (causing building projects cost and time overruns) for proposed projects especially public funded projects. Thus, Building Price Forecasting (BPF), which is the basic for cost advice that public client organisations use as budget for assessing building projects funds from government is of significant importance within the context of organisational management and performance. Organisation management theory state that the outcome of organisations is influenced by behaviours inherent in organisations. Hence, attempts at improving building price forecasting in public client organisations would require an understanding of the effect of the behaviours therein. Exploring Organisational Behaviour (OB) model, this paper presents and discusses theoretical conceptions for understanding BPF process within public sector client organisations with a view to improving and formalising the process. The model conceptualises building price forecasting at the three levels of an organisation i.e. individual, group and organisation within the 'input-process-output' framework. For the required data, expert survey and focus group discussion were conducted based on the outcome of a literature review which gave insights to the likely steps required for a formalised BPF process. 40 questionnaire were distributed to professionals in 40 firms both in Kaduna and Abuja, descriptive and inferential analysis was used to analyse their responses. To appraise potential influences of organisational behaviours on BPF process, 70 questionnaire were distributed to participants of BPF production units in six Universities and Partial least square – structural equation modelling (PLS – SEM) was used to analyse the relationships and the influences. The study found that organisational behaviours interactions with one another do influenced an individual task performance, which ultimately affects the outcome. The study also found that there is no formalised and documented BPF process, therefore, the study recommends that public client organisations should adopt the formalised process established herein and ensure the policy of forming teams for the purpose of BPF formulation in order to enhance the performance of the BPF.

Keywords: Building price forecasting, Cost advice, Organisational behaviour, Public sector client organisation.

INTRODUCTION

Clients of the construction industry need reliable cost advice to use in making their building construction investment decision; but this has been hampered by many factors causing poor performance in construction industry and dissatisfaction to the client, Fortune (1999). Eythorsdottir (2012) observed that the underperformance of the construction industry (CI) has direct link with unrealistic and unreliable cost estimates the world over, resulting in schedule delay and unexpected cost overruns. Erdis (2013) lamented how these unexpected cost overruns caused considerable losses to both parties the contractor and client and ultimately led to reduction in value for money and dissatisfaction.

Flyvbjerg (2013) argued that such unexpected deviations in construction costs cannot always be traced to only technical explanations. He observed that if under performance is attributable to issues of cost overruns and delays, then an improvement in accuracy could, over time be expected as estimators learned from their experiences. Some researchers have drawn different conclusions to rest on such as, human error (Skitmore, 2009); planners and or promoters deliberately make optimistic forecast as a necessary means to getting projects approved (Bayram, 2013) and poor cost estimation models, (Eythorsdottir, 2012). However, Zadawa, Shehu, Ahmed and Gambo (2017) observed that the causes of these ongoing problems are the uncertainties in the feasibility stage of projects when project investment decisions are made. Essa and Fortune (2009) opined that such poor performance can be expected to be made worse by the government's policy of including budget in its future publicly funded projects. This situation has drawn researchers in the field of construction to call for improvement in the quality and performance of cost advice in the construction industry, Eythorsdottir (2012). But despite the theories of cost estimates and cost planning, Scholars are still seeking for solutions to the achievement of this need.

Among many factors militating against the realisation of quality cost advice is the setting of the reliable building budget estimates which is building price forecasting, Fortune (2007). Interestingly & Kirkham (2015) corroborated that formulating price forecast to set up a budget is strategic cost advice and it will help the prospective client to decide on whether to proceed with his project investment proposal or not. Abanda, Kamsu-Foguemand Tah (2017) observed that strategic cost advice is very important and is the only substantive thing that brings tangible expectations to a prospective client who wants to invest in a building project.

Cost advice has been linked with organisations' behaviour (OB) with clear pointer that study in this area should be aligned with the theory of OB. Mullins(2010); Robbins and Judge, (2013) indicate that organisational outcomes are influenced by behaviours inherent in organisations. Impliedly therefore, BPF is affected by OB and this effect will determine its success or otherwise, since Cost advice is the outcome of BPF it shows is a reflection of organisational performance. Bayram & Al-Jibouri (2016) observed that for sustainable development solution, building price forecasting systems need to consider the influence of human behaviour in the process of formulating cost advice the clients in their investment decision making. Fortune and Cox (2005) posit that in order to develop an understanding of how BPF advice can have its quality enhanced, it was necessary to consider the process itself. This begets the need for understanding the process of formulating the BPF to set the budget which, according to Kirkham (2015) is done at the very early stage of the project inception long before working drawings are made.

THE RESEARCH PROBLEM

Zadawa *et al.*, (2017) lamented that lack of compliance with the guidelines of the Public Procurement Act (PPA, (2007), and especially the unknown method by which organisations, especially Public Sector Client Organisations (PSCO) come about the budgets for their building projects is one of the major contributors to poor performances

of construction projects in Nigerian construction industry (NCI). This is especially true in the case of assessing funds from Tertiary Education Trust Fund (TETFund) by various institutions. Zaki, Musa-Haddary, Kolo, and Abdullahi (2019) posits that if BPF formulation process is formalised and followed during budget preparation for assessment of funds from TETFund there wouldn't be time and cost overruns or delay in projects in Nigeria's tertiary institutions. This study seeks to formalised the BPF process in order to address this gap.

LITERATURE REVIEW

Yang *et al.*, (2013) trailed the development of organisational theories to three recognisable stages, namely, classical, neoclassical and modern. Walker (2015) posits that these theories have been developed into and variously explained in a four-approach category framework comprising classical, human relations, systems and contingency. Among these theories, while the majority of researches in BPF have largely been driven by the classical theory – technical, modern day consideration of organisational management requires that such considerations should be driven by both the system and contingency theories. Mullin (2010) posits that organisations do not only work by focusing on the social aspect (though an important and critical component for success), the systems theory integrates both the classical and human relation approaches and promotes the importance of the socio-technical system while considering the organisation within its external environment. This is achievable through OB.

THE BUILDING PRICE FORECASTING (BPF) PROCESS

Building Price Forecasting is essentially done to help in critical decision making at the very initial stage of project proposal and its process is aimed at providing standard to use to meet or ensure adherence to public capital procurement requirements while utilising industry standards and best practices (GAO, 2010). Surprisingly, this research could not find documented standard processes for

preparing BPF in the United Kingdom (UK) literature apart from specific narration of the constituents of the processes. Although the studies of both Bowen (1993), and Fortune (1999) were about the BPF processes, but the steps involved were not documented. However, the study found that Governmental Accounting Office (GAO, 2010) documented 12 STEPS which have been adopted by Department of Energy (DOE, 2011) for use in United States (US) public sector. Even though the Quantity Surveying practice in UK may differ from that of US it was worth the pains-taken for the fact that the documented 12 STEPS are found to be in tandem with the specific narrations identified from the UK textbooks thereby making the steps seemingly generic in global context.

The Essence of Organisational Behaviour (OB) Theories in BPF Process

Organisational behaviour is described by Robbins and Judge (2013) as 'a field of study that investigates the impact that individuals, groups and structure have on behaviour within organisations, for the purpose of applying such knowledge towards improving an organisation's effectiveness,' and further defined it simply as 'the study of what people do in an organisation and how their behaviour affects the organization's performance'.

Mullins (2010) describes OB as being, 'concerned with the study of behaviour of people within an organisational setting. It involves the understanding, prediction and control of human behaviour.' They further defined it simply as, 'the study and understanding of individual and group behaviour and patterns of structure in order to help improve organisational performance and effectiveness'. These definitions are a pointer to why OB consideration in BPF process gaining essential ground.

Apart from itobvious focus on the people dimension (and behaviours) in organisations as shown in the descriptions and definitions

above, Quick and Nelson (2012) posit that the importance of OB in BPF process is the systematic approach it adds to improving the predictability of these behaviours. Other benefits include: helping employees balance work-life conflicts, creating a positive work environment, and improving ethical behaviour, Robbins & Judge, (2013). Hence, Mullins (2010) opines that an understanding of the human element and behaviour of people are necessary for the organisation to achieve her goal. Cooke (2015) corroborates that organisations operate on defined aspects which entail getting outputs of individuals and/or groups in an fashionable organisational structure process to achieve sufficient outcome. Achieving this individual task performance in sufficient manner Robbins & Judge (2013) provides an overview of the OB model. The OB model (see Fig.1) is comprised of three types of

variables i.e. inputs, processes, and outcomes; operationalised at three levels of analysis present in all organisations namely: individual, group and organisational. The OB model does not show the lines of relationship between the variables within the organisation, which according to Cooke (2015) is necessary to have the knowledge of the existence of the relationships in the organisation. Giving the reasons for this necessity, Quick and Nelson (2012) stated that it is necessary because it explains the organisation's reality and challenges and form the aspects of the organisation's functionality. In line with this argument the lines of relationships within an organisation (see Fig. 2) not provided in the OB model was derived from the data collected in the column of influence (function) in Tables 1 and 2.

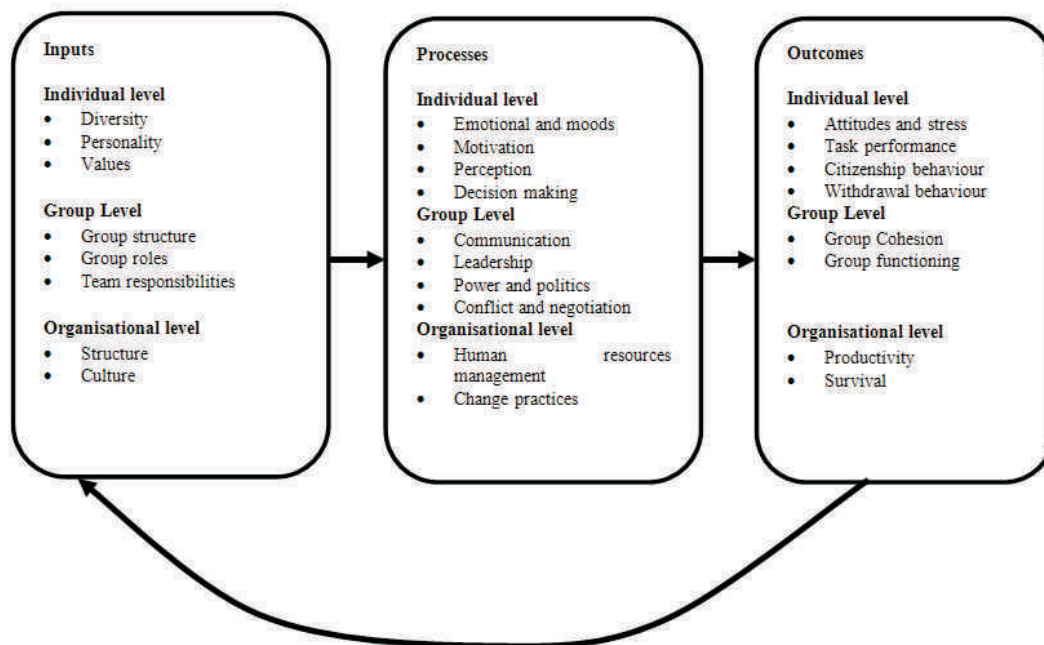


Fig. 1: A Basic Organisational Behaviours' Model

Source: OB (Robbins and Judge 2013)

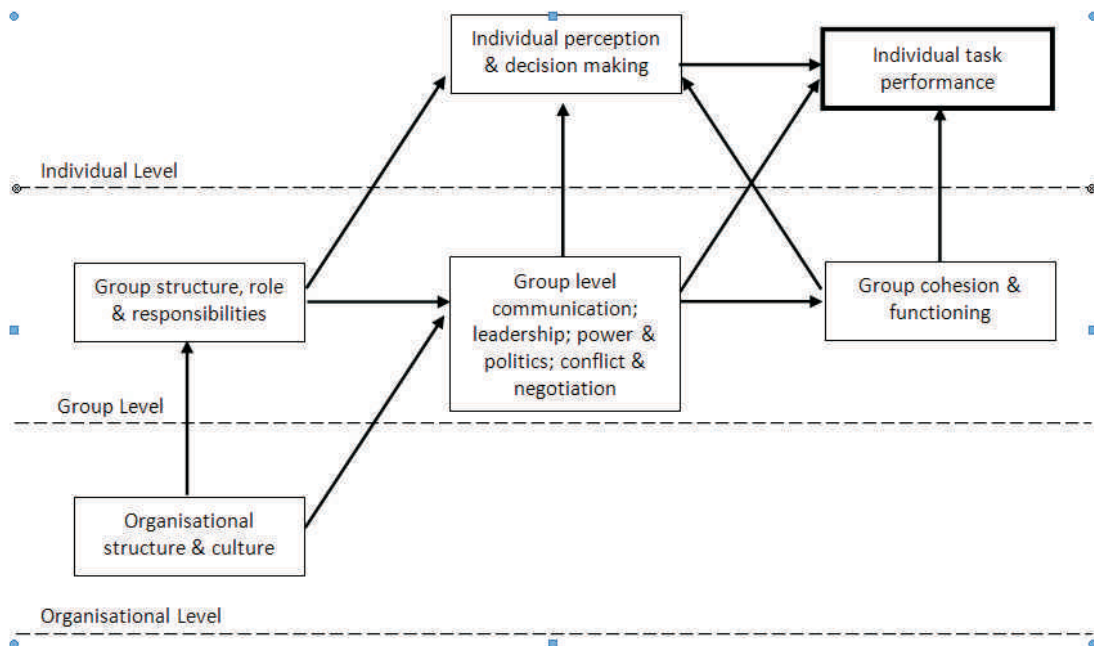


Fig. 2: Framework of the influences/functional lines of relationships in an organisation

Formalising the BPF Process

For a relatively long period of time the concepts of the cost advice function of the quantity surveyors (QS) in terms of theories, principles and procedures; have largely revolves around consultancy services whereby the QS assumes an independent and impartial position in providing services to the industry. However, recent developments are challenging this position whereby in-house QS services are once again becoming popular and in demand. Two major support for this changing landscape in QS services is the increasing demand for cost advice in construction firms, Donald (2015). Thesecond, which is very instructive, is the changes brought by the introduction of standards NRM for providing early stage estimates (RICS, 2011; 2013) i.e. NRM1 – the order of cost estimate (which wasnot a consideration before the coming of the NRMs i.e. 1, 2 & 3 in to the industry), which is the main outcome of any BPF system. The NRM3 also targeted at providing the means of forecasting cost maintenance of building, makes it and the NRM1 more client organisation orientated, hence further

promoting and reinforcing the need for in-house QS services.

Bringing the strategic considerations of public sector organisations in terms of construction projects to the fore the failings of the traditional approaches to cost advice i.e. evaluative approach has to give way to paradigms that situate BPF as a core function within these organisations. This therefore, challenges the application of theories outside contemporary organisation management (particularly organisational behaviour) towards solving the inherent problems of organisations. Hence, the need to harness the theories of organisational behaviours among others in investigating the problem identified in this research as suggested in the call for a systems view to solving organisational problems in construction (Kelly, Male & Graham, 2015; Walker, 2015); and the need for considering the OB in building construction cost advice became imperative. This is because according to Walker (2015), Cost advice of construction projects is an individual task performance that requires collaboration, commitment and dedication

of other professionals in the field to be accomplished. This means teamworking in terms of gathering information. Tanner (2014) observed that, 'an individual's function revolves round the cooperation he obtains through collaboration with other construction team members'. Thus, there is the need for formalising the BPF process.

Exploring these concepts and theories this paper identified ten processes that are known to influence behaviours in organisations, namely: perception, motivation and decision making - at the individual level; leadership, communication, power, politics, and conflict - at the group level; while at the organization level - human resource management and change practices (were not considered in this paper because they are functions carried out at the point of employment/engagement). Figure 3 shows the possible influences the behaviours have on each other and an indication of the fifteen mediation hypotheses established from literature.

METHODOLOGY

The target population for the study is client organisations' BPF production participants (i.e Architects, Quantity Surveyors, Builders, and services engineers) being the unit of analysis. The Sample size of the population was drawn based on purposive sampling technique, reason for the choice being that a good BPF technique relies on competent judgement based on construction experience and knowledge. First, a total of forty (40) structured questionnaire were distributed to seek for the professionals' EXPERT opinion in establishing the BPF process steps. Second, a total of 70 structured questionnaire (using sampling units to draw the sampling size owing to the fact that the population is known) were distributed to professionals in both Estate departments and

procurement units of six Universities in the second phase of the data collection. This was done with the view of ascertaining the basis for assessing what is done in-house in some public Universities. The Universities involved were five federal Universities and one state University - namely, Ahmadu Bello University (ABU), University of Jos (UniJos), University of Abuja (UniAbuja), Federal University of Technology Minna (FUTMinna), Bayero University Kano (BUK) and Kaduna State University (KASU).

To establish a theoretical framework for explaining the relationship between client organisation and BPF, two tools were adopted - descriptive statistics using questionnaire survey, and inferential using focus group discussion (FGD). The descriptive analysis provided mean values, standard deviations and percentages in arriving at the BPF processes and professionals roles as obtained in practice in the NCI. The focus group discussion was held with the academicians which formalised the BPF process steps. Establishing the nature of relationships and the influences between client organisations and BPF variables was achieved by using PLS - SME (Partial Least Square - Structural Model Equation) for the analysis.

Results and Discussion

The Robbins and Judge's (2015) model that was used is a two dimensional variable-based typology, vertically defined by the various levels in organisations i.e. individual (QS), groups/team and organisation; and horizontally by the nature/type of variable i.e. inputs, processes, and outputs. So Experts' opinion was sort for and their responses are presented in the Tables below.

Table 1: Establishing BPF Process and Organisation Highest Influence on the BPF

S/N	Perceived Forecasting Steps	N	The QS	Group or Team	The Organisation
			1	2	3
1	Establish level of details required in the forecast	40	47.5%	15.0%	37.5%
2	Make formal request for forecast	39	5.1%	7.7%	87.2%
3	Collect, clean & analyse cost data	40	97.5%	0%	2.5%
4	Qualify estimate (in terms of excludes)	40	85%	5%	10%
5	Determine type of estimate required e.g. preliminary, viability etc	40	70%	5%	25.0%
6	Gather relevant project information	39	71.8%	28.2%	0%
7	Determine value for money for the client	31	32.3%	61.2%	6.5%
8	Prepare the estimate	40	97.5%	2.5%	0%
9	Consider project factors (including uncertainties)	39	74.4%	12.8%	12.8%
10	Select, adjust & apply cost data/info	40	100%	0%	0%
11	Apply necessary skills, expertise and judgment	33	81.8%	15.2%	3%
12	Select price estimating methods e.g. functional, superficial etc	40	100%	0%	0%
13	Identify client's needs & objectives	37	13.5%	43.25%	43.25%
14	Monitor and review estimate	40	77.5%	12.5%	10%
15	Check governance policies	39	30.8%	43.6%	25.6%
16	Scan and understand available information	40	72.5%	7.5%	20%
17	Consider factors affecting accuracy of estimate	30	96.7%	3.3%	0%
18	Establish desired accuracy level	40	62.5%	7.5%	30%
19	Communicate the estimate	40	65%	35.0%	0%
20	Determine purpose of forecast	40	35%	17.5%	47.5%
21	Consider factors affecting selection of estimate methods	27	96.3%	0%	3.7%

Table 1: The table sought to find out who the respondents feel is responsible for carrying out each of the steps' function. The result shows the respondents had undivided opinions only on numbers 10 and 12 given the steps' function 100% to the QS. The overall picture gives QS the major participant in the BPF process as the QS got highest percentage ranging from 62% – 100% in 15 steps apart from 'establish level of details required in the forecast' which has 47.5%. The grey area is seen in the

proportion of responses on the issue of 'identify client's needs & objectives' 43.25% of the respondents were of the opinion that is the 'group or team', and the 'organisation' that influence the step. This perhaps depicts the notion that 'client's needs and objectives' are inclusive in the brief and not a step on its own since both the group or team and client are involved at the brief stage. Invariably, the result proved there is no formal BPF process in NCI.

Table2: Focus group validation of BPF process Steps

S/N	Identified forecasting activities	Agreed/ accepted activity	Order To form steps	Who carries the activity (QS=1; Group or team=2; Organisation=3)
1	Establish level of details required in the forecast	✓	2	3
2	Make formal request for forecast	✓	1	3
3	Collect, clean & analyse cost data	✓	10	1
4	Qualify estimate (in terms of excludes)	✓	14	1
5	Determine type of estimate required e.g. preliminary, viability etc	✓	4	3
6	Gather relevant project information	✓	6	2&3
7	Prepare the estimate	✓	13	1
8	Consider project factors (including uncertainties)	✓	8	1
9	Select, adjust & apply cost data/info	✓	11	1
10	Select price estimating methods e.g. Functional, superficial etc	✓	9	1
11	Monitor estimate	✓	16	1
12	Check governance policies	✓	8	1&3
13	Scan and understand available information	✓	7	1
14	Establish desired accuracy level	✓	5	1
15	Communicate the estimate	✓	3	1
16	Determine purpose of forecast	✓	15	3
17	Apply necessary skills and expertise judgement	✓	-	-
18	Adjudication	✓	17	3
19	Editing final forecast	✓	17	1
20	Brief	✓	2	3
21	Time horizon	✓	12	3
22	Review estimate	✓	17	1&3

Table2: The result shows that 22 steps were highlighted by the participants. During discussions the ordering had the same number to multiple steps such as in the case of 'establish level of detail required in the forecast' and 'brief' they came 2; 'consider project factors (including uncertainty)' and 'check governance policies' came 8. The 'adjudication', 'edit final forecast', and 'review estimate' came 17. Worthy of noting is the final number arrived at which is 17 (see table 3) as the initial steps figured out by the researchers.

The influence column pointed out the influence (referred to here as responsibility) of every entity, which clearly show that most functions are an individual's function and the QS is the one responsible for most of them. Specifically the QS is involved in all except in 7 steps where the influencer is the client (organisation) that is in the case of 'make formal request for the forecast', 'establish detail required for the forecast', 'determine the type of estimate required', 'determine the purpose of the forecast', 'adjudication', 'brief', and 'time horizon'.

The Table shows that gathering of relevant project information require the participation of the team and organisation for all the inputs to be put together for quality BPF outcome. The very interesting point to note is the 'apply necessary skills and expertise judgement' a step the participants accepted it should be included as a step. The step was initially included to test the knowledge of professionals in the questionnaire as explained under Table 1. However, when the participants came to arrange the steps in the order they should be, significantly they could not find it as a step nor who should be responsible of influencing it. This perhaps construed studies by Keith (2009), Cartlidge (2009), Kirkham (2015), and RICS (2013) all asserts that procurement and design of projects, providing cost advice to clients, cost management of construction projects require professional competencies, skills and expertise innovations in carrying the tasks. This then proved that for a professional to be involved in the exercise of BPF the professional must be judged to have necessary skills and expertise judgement that he can apply in making decisions.

Table 3: Focus group validated BPF process Steps

S/N	ESTABLISHED ACTIVITIES	ORDER OF STEPS
1	Make formal request for forecast	1
2	Establish level of details required in the forecast	2
3	Brief	2
4	Determine the purpose for the forecast	3
5	Determine the type of estimate required e.g preliminary, Viability, etc	4
6	Establish desired accuracy level	5
7	Gather relevant project information	6
8	Scan and understand available information	7
9	Consider project factors (including uncertainties)	8
10	Check governance policies	8
11	Select price estimating methods e.g functional, superficial, etc	9
12	Collect, clean & analyse cost data	10
13	Select, adjust & apply cost data/information	11
14	Time horizon	12
15	Prepare estimate	13
16	Qualify estimate (in terms of excludes)	14
17	Communicate the forecast	15
18	Monitor the forecast	16
19	Adjudication	17
20	Edit final forecast	17
21	Review estimate	17

Table 3: Table presents the validated BPF process steps that can be adopted for use in the NCI especially the Public client organisations that are the target of this study. The final result of the validation can be deduced to be 17 STEPS in all. The reason for this is confirmed in DOE (2011) work break down structure (WBS). The WBS shows that establishing details required for forecast entails detailed and well understanding briefing. This means brief is contained in step 2. The WBS also show that considering project factors (uncertainties) entails statutory policies must be checked.

This shows that governance policies are checked in step 8. The same explanation could be given to 'adjudication', 'edit final estimate', and 'review estimate'. The WBS shows that they all belonged to one step – Review estimate.

However, the study integrated the processes from the professionals in the field with the Focus Group and what is obtainable in the WBS and it came up with 17 STEPS as “FormalisedBPF Process Steps” as can be seen in Table 4.

Table 4: Formalised BPF process Steps

S/N	ESTABLISHED ACTIVITIES	ORDER OF STEPS
1	Make formal request for forecast	1
2	Establish level of details required in the forecast	2
3	Determine the purpose for the forecast	3
4	Determine the type of estimate required e.g preliminary, Viability, etc	4
5	Establish desired accuracy level	5
6	Gather relevant project information	6
7	Scan and understand available information	7
8	Consider project factors (including uncertainties)	8
9	Select price estimating methods e.g functional, superficial, etc	9
10	Collect, clean & analyse cost data	10
11	Select, adjust & apply cost data/information	11
12	Time horizon	12
13	Prepare estimate	13
14	Qualify estimate (in terms of excludes)	14
15	Communicate the forecast	15
16	Monitor the forecast	16
17	Review estimate	17

Table 5:- Extent OB Determinants are Exhibited

OB Behaviours	Level	Extent Exhibited
Perception	Individual	Low
Motivation	Individual	Moderate
Decision making	Individual	High
Leadership	Group	Moderate
Power	Group	Moderate
Communication	Group	Moderate
Politics	Group	Moderate
Conflicts	Group	Moderate

Table 5 shows the perceptions of the participants of the BPF process is low. A moderate level of motivation is exhibited by professionals engaged in the BPF process while the level to which they engage with an appropriate decision making model is high. At the group/organisation level, both leadership and power are exhibited to a moderate level, while meeting the requirements of effective communication is exhibited to a moderate level. Similarly, both politics and conflicts are exhibited to a moderate level in public client organisations relative to the BPF process. Hence, apart from perception of the BPF process and engaging with appropriate decision making models both of which are behaviours determinants at the individual level (and exhibited to a low and high extent

respectively), all the remaining determinants (all at the group/organisation level except one) are exhibited to a moderate level within the BPF process in public client organisations. The result depicts the outcome at the individual level could affect the attainment of BPF requirements (i.e. in terms of information and teamwork) seeing that perception has positive relationship with both motivation and decision making – (see Fig 3), which has positive influence on individual task (in this case BPF), low perception could affect all other behaviours (Boakye, 2015).

Conclusion and Recommendation

The need for a formal documented BPF process is paramount for realistic construction projects in PSCO and CI in

general. This study could not find a formalized documented BPF process to explore for the understanding of BPF process in UK domain from which our NCI adopts its practice. The results from the investigation carried out proved there is no formalized documented BPF process in our NCI either leaving the formulation of BPF to the acceptance standard of the organization concern. Hence, this study established a formalized BPF process steps for realistic and reliable cost advice in not only in PSCO but in CI in general. In addition, for quality BPF to be produced, the study assessed the interrelationships of the participants of the

BPF process for healthy behaviours among the participants. The result in this paper shows the relationships of the participants is not optimal and especially the individual's perception.

Having established the formalized BPF process this study recommends the PSCOs and CI in general to adopt it as matter of necessity, and eradicate the indicators that could lead to wrong perception in their policy of forming teams for the purpose of BPF formulation in order to enhance the performance of the BPF.

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