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Factors Affecting Front-End and Building Project Performance in South-South Nigeria

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Abstract
This study is aimed at identifying factors affecting the front-end and identify key factors of the front-end influencing performance of public building projects in South-South Nigeria. The study used a survey research design method of investigation, and a purposive sampling technique to select a sample size of 400 from a population of 968 respondents using the Slovin's formula. The data collection and survey instrument included a well-structured questionnaire and personal observations and visits to elicit information from respondents/public building project locations/sites. The collected data was presented in the form of frequency distribution using descriptive statistical tools via IBM SPSS Statistics version 26.0. While mean score and factor analysis were used to analyze the study's main objectives. The study's findings indicate that the factors affecting the front-end of public building projects in South-South, Nigeria includes poor scope definition as the main cause of project failure (cost and schedule overrun), with a mean score of 2.67, awareness of practice of FEP is low, unstructured, subject to subjective individual professional opinion and ineffective with a mean score of 2.66, project definition of large public building is best achieved by stakeholder's collaboration with a mean score of 2.65, lack of team skill/competence affects FEP with a mean score of 2.58 and lack of organizational commitment to FEP affects the process with a high mean score of 2.58 from the response of 372 responses used for the study. The study's results further revealed nine (9) clusters named in order of significance as the factors of frontend influencing public building project performance includes; political, social and economic climate, organizational culture, project team training and development, stakeholder alignment and collaboration, common vocabulary and understanding, use of structured stage-gated process, process integration, activity sequencing, and front-end management framework. The study recommends that in order to prevent scope expansion and foster collaboration among stakeholders, the project frontend should be adequately defined from the outset. Professional bodies and stakeholders should increase awareness, and a collaborative culture should be encouraged
Keywords: *Frontend, Project Management, Public Building Projects, South-South, Nigeria.*

1.Introduction

Projects have gained worldwide recognition as a means of implementing organizational strategy (PMI, 2017). Public projects such as Civic Centres, Conference Centres, Cultural Centres, Libraries etc are landmark buildings initiated to create public value and benefits for the citizens. Landmark buildings signal

innate qualities of cities devised to attract temporary visitors or more permanent setting of firms and individuals (Enwudor, 2024). Such buildings should provide stimulating, safe and secure environment for work, studies, business, leisure, cultural and social interactions. It is important that such high worth buildings be conceived, planned, constructed and delivered efficiently and socially, economically and environmentally sustainable. Despite the acknowledged importance of public buildings for the provision of critical infrastructure and services to the citizens, the delivery of public building projects in the South-South Region, Nigeria face daunting challenges: cost and schedule overrun, poor conceptualization, non-engagement of users, poor quality jobs, lack of sustainability impacts, loss of user value, abandonment, economic stagnation, user frustration and dissatisfaction. These problems are often attributed to limited or lack of understanding and poor management of the frontend phase (Larsen et al., 2021).

A building project may be divided into two broad phases: (i) The less visible front - end (FE), also called Project Definition Phase (PDP), pre - project, front end loading (FEL), programming, schematic design, front-end planning (FEP); and (ii) the more tangible and popular phase, the execution (construction) phase (Enwudor, 2024). The front-end is the first phase of the building lifecycle. It starts when a strategic need is identified by the organization as "opportunity (achieving something desirable) and problems (resolving something harming or troubling) and ends when a decision is taken to invest on the project (William, 2016). Front-end planning is defined by Construction Industry Institute, CII (2012) as "the process of developing sufficient strategic information for owners to address risk and decide to commit resources to maximise the chance of a successful project" Enwudor (2024) on the other hand defined Front-end planning as "the first phase in project delivery consisting of three modules (i) determining purposes (Stakeholders needs and values), (ii) Translating those needs into criteria for both product and process design and (iii) generating design concepts against which requirements and criteria can be tested and developed". The FE encompasses the four stages of conceptualization, feasibility, concept and conceptual design. The main goal of the FE is to define the project and produce a comprehensive project scope which will be the groundwork of subsequent project management processes. An ill-defined project may lead to project failure and unexpected outcomes (Samset, 2014) whereas a detailed scope is known to eliminate risks, (unknown items) from the project and make the project run smoothly and efficiently (Larson et al, 2021; CII, 2012).

Governments all over the world are striving to improve citizens' welfare through project implementation yet public projects worldwide continually fail to meet set targets (Kwak & Smith, 2009). For instance, PMI (2016), Pulse of the profession: The high cost of low performance revealed that government organizations waste US$22 Million for every US$1 Billion invested. In a similar report on Nigeria, UNIDO (2016) reported that in the last twenty years only 38-39% of public sector projects in Nigeria were successful. The Presidential Project Audit Committee PPAC (2011) had reported that 11,886 Federal Government projects worth 7.78 Trillion Naira had been abandoned. Only recently the NDDC Forensic Audit-Report showed 13,777 projects valued at N3 Trillion were "substantially compromised" or challenged! The Nigerian building industry is notorious for poor project performance. Project abandonment, poor quality jobs, none delivery of value and benefits, cost and schedule overruns, none consideration of the social, economic and environmental impacts etc. These problems arise from poor or lack of project definition and result to citizens' frustration, loss of value and dissatisfaction.

For instance, the multi-billion naira Bayelsa 18 storey Tower Hotel was abandoned for too many changes (poor project definition); Dr. Obi Wali Integrated Cultural Centre in Port Harcourt was totally demolished less than ten years after completion for not meeting stakeholders requirement (poor definition). The nine-storey Riv-Insurance Building has remained abandoned for over Thirty (30) years for poor conceptualization and the N100bn Rivers MonoRail project is abandoned/rejected by stakeholders as 'unnecessary' due to poor conceptualization (Govt. Gazzette 16, 2018). This scenario plays out in all Niger Delta States calling for urgent actions.

McElroy and Mills (2000) give the top reason for project failure as poor pre-project planning (including 'lack of ability to manage the front end very well'). Furthermore, Morris (2013) states that "Data shows that most of the factors which seriously affect project outcome, for good or ill, will have been built-in to the definitional decisions. The problem is, we don't know generically what managing the front-end really

entails". It is therefore necessary to investigate the economic loss, user's loss of value, frustration and dissatisfaction with the built environment in order to mitigate, prevent or eliminate the occurrence altogether.

The objective of the study is to identify factors affecting the front-end of public building projects, as well as the key factors of the front-end influencing performance of public building projects in South-South Region (SSR), Nigeria.

2. Literature review

Projects are ubiquitous, and everybody does them. Projects are the driving force of every organization. Projects can be looked upon as the change efforts of the society and the pace of change has been increasing. Therefore, effectively and efficiently managing change efforts is the only way organizations can survive and grow in this modern world (Enwudor, 2024). Projects have changed the way we live and work. They come in varying magnitude and complexity. Some small and simple others large and complex. Some consume little resources, others lasting several years and costing so much! A project can create a product that can be either a component of another item or an end item in itself. A capability to perform a service; a result such as an outcome or a document.

The concept of project seems to have appeared in the fifteenth century and has its roots in architecture. The ambiguity of the word "Project" is well acknowledged in the literature; its Latin root (Projicere — throw forward) suggests movement, a trajectory, a certain relationship in space and time and a possible separation of planning and performance project and implementation (Boatright, 1994) one can understand here why the project manager in modern project management is therefore like an architect and as such must plan first and implement second.

Modern project management can be traced back to 1950s and 1960s to engineering achievements, particularly to military and defence Modern Project management is based on the philosophy and faith in reason, science and technology (Morris, 2013). According to Enwudor (2024) 'a project is a temporary organization created by its base organization to carry out an assignment on its behalf – to generate benefits for the base organization and other stakeholders. A project may be divided into two broad phases: the front-end (project definition) phase and the execution phase. The front-end phase is the phase that identify the needs and values of project stakeholders and develop appropriate design solutions to satisfy them (Wheltons & Ballard, 2002).

Cleland (1996) defines project management as "the creation and delivery of something that did not previously exist on an adhoc basis so, that the project meets cost, and schedule objectives. Projects are building blocks in the strategic management of a nation which when conceptualized, designed produced and put into consumer utilities facilitates national growth and survival.

The purpose of project management is to predict as many of the risk and problem as possible and to plan, organize and control activities as possible in spite of all the difficulties and risks. This process starts before any resource is committed and must continue until work is finished. The aim is for the final result to satisfy the performance and quality requirements of the project sponsor or consumer, within an agreed time scale and without using more money and other resources than those originally set aside or budgeted.

2.1 Current practice of managing the frontend of public buildings projects.

Managing a project can be subdivided into the two board phases of a project: (i) the front-end phase and (ii) The Construction (Execution) phase. While the construction phase is easily seen, the front-end phase appears abstract, difficult but very important yet underrepresented in the literature (Hansen et al., 2018; Enwudor, 2024). Current practices of FEP is unstructured, lacking in awareness, lack skilled/competent project managers/team. The process itself is poorly understood and unregulated the public-sector organization lack the structures and commitments for frontend planning. In fact, FEP is almost non-existent

or very rudimentary, without involvement of external stakeholders which result to poor project outcome (Akinola et al., 2019; PMI, 2016; Olateju et al., 2001; Idoro & Patunola-Ajayi, 2009)

The front-end or project definition is the project phase that identifies the needs and values of project stakeholders and develops appropriate design solutions to satisfy them (Wheltons & Ballard, 2002). Winch (2002) defined project stakeholders are those parties that will incur a direct project benefit/harm from product. Stakeholders have knowledge, expectations, requirements, wishes and concern about the project which can only be elicited if they are motivated and involved in the project definition. Too often these stakeholders are neglected, their input denied and the project result is something that fall sort of their expectations. William (2016) recommended that it is important to build good relationship with key stakeholders and secure their commitment during the front-end of a project. Effective stakeholder communication practices help ensure fruitful engagement with stakeholders and consequently lead to a higher chance of achieving a comprehensive set of stakeholder's need and requirements".

Accurately defining stakeholders needs and requirements is a right step in achieving their satisfaction, a key criteria of project success.
A major change is the need for a shift in the focus from building as an end in itself to building as a means to facilitate the achievement of the end-users' objectives in the building, and a shift from the mechanistic emphasis on engineering needs to the social, psychological and environmental needs of the end-users. This suggests that definition has to be *progressive (with feedback)* and collaborative (Enwudor, 2024).
In pursuance of the principal objective of this study which is to ensure successful public projects by having a soundly planned front-end, stakeholders, particularly the client, the designer and the end-users/beneficiaries have the potential of defining the project completely and comprehensively thereby improving the quality of the outcome and the satisfaction of the end-users. However, this requires a migration from management *of* stakeholders to management *for* stakeholders' approach. In the former, stakeholders are seen as a means to achieve an end. They are seen as primary providers of resources. The project needs them to fulfil its purpose and prevent hindrances. In the latter, which is gaining currency, stakeholders are seen as valuable in their own rights and not means to specific ends. They are sources of ideas, support and knowledge that are needed to enhance value for the organization and other stakeholders. In this approach, the stakeholder, especially the end-user is the focus of the project who must be satisfied with the social, environmental and economic aspects of the project. In this perspective stakeholders participation requires a process of dialogue and ultimately consensus building of all stakeholders as partners, who together define the problem, design, possible solutions, collaborate to implement them and monitor and evaluate the outcomes.

2.2 The project front-end in the project lifecycle

Project lifecycle is the path a project takes from its inception to its end. However, every project is managed by five processes: initiation, planning, executing, monitoring and controlling, and closing (PMI, 2017). Shenhar et al. (2002) and Wateridge (1998) relate project success to project lifecycle because different success factors impact the project at different stages in the project lifecycle. Projects are classified into three types of lifecycles: Predictive lifecycle (Waterfall) which is plan-driven, has high definition objectives and clear method of execution such as construction projects. Adaptive lifecycle (Agile): which is process-driven with clear objectives but undefined method. Iterative lifecycle. In between the two extremes is iterative lifecycle with no clear objectives or method/process of execution.

The building lifecycle is divided into a number of stages or phases depending on the organization or country. Horsely, France and Quaterman (2003) identified three phases, conception/ design phase, construction phase, and operation phase. Wideman (1990) and PMI (2013) identified four phases, the generic phases: conception, planning, execution and transfer. The Commission for Architecture and Built Environment, CABE (2003) also use four phases: prepare, design, construct and use. The Nigeria construction industry adopt the four-phase structure: conceptualization, planning, execution and termination. Figure 2 shows the position of the project front-end in the building lifecycle.

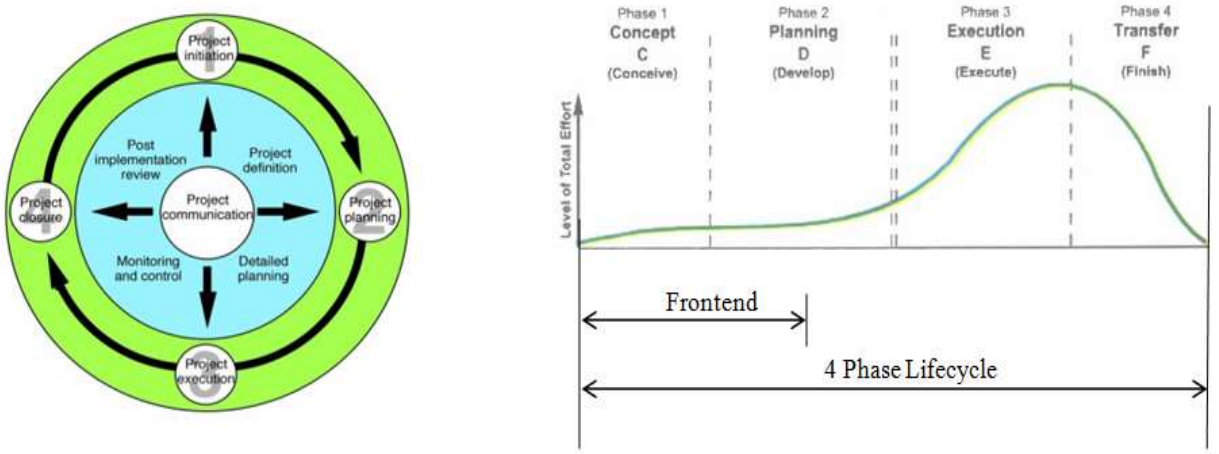

Figure 2: Project Lifecycle and Generic 4 Phase Lifecycle (Wideman, 1990)

It must be noted that while the project execution phase consumes more resources (time, money, materials, human efforts), it is the diligence and efforts made at the front-end and planning phases that have most significant impact on the project outcome (Enwudor, 2024). As the project progresses through the phases, its level of definition increases, at the same time, the ability to influence the final characteristics of the project outcome decreases. At the beginning, the opportunity to create value is highest, ability to define requirements is very high, ability to make changes (in design) is high and cost of such changes are relatively low compared with later phases. This is the basic principle of front-end planning, that is the more a project is completely defined, the less the chances of experiencing schedule and cost overruns and less the change orders. The influence curve, figure 3 also show that risk and uncertainty are highest at the beginning, information available is low, so is cost and staffing level (PMI, 2017). Decisions made early in the project have high impact on later stages of the project.

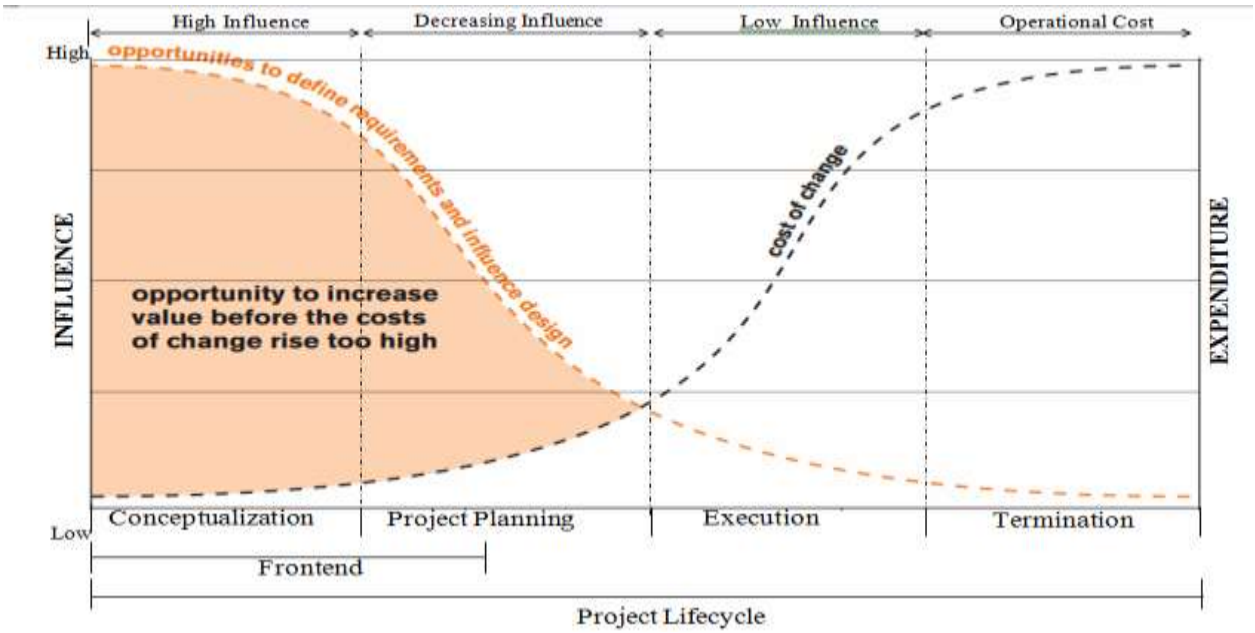

Figure 3: Influence and Expenditure curve for the project lifecycle (Cabe, 2003)

Hutchinson and Wabeke (2006) found that if project definition resulted to high value project, even the poor execution of that project would be of better value than the project that has been poorly defined (this is illustrated in figure 2. Stating that well defined project is far more important and beneficial than the execution. In figure 4b, phase 1-3 is value identification and proposition while phase 4-5 is value realization. It is easier to create value at the beginning than at the end, and the high value created by good project definition cannot all be cancelled by poor execution.

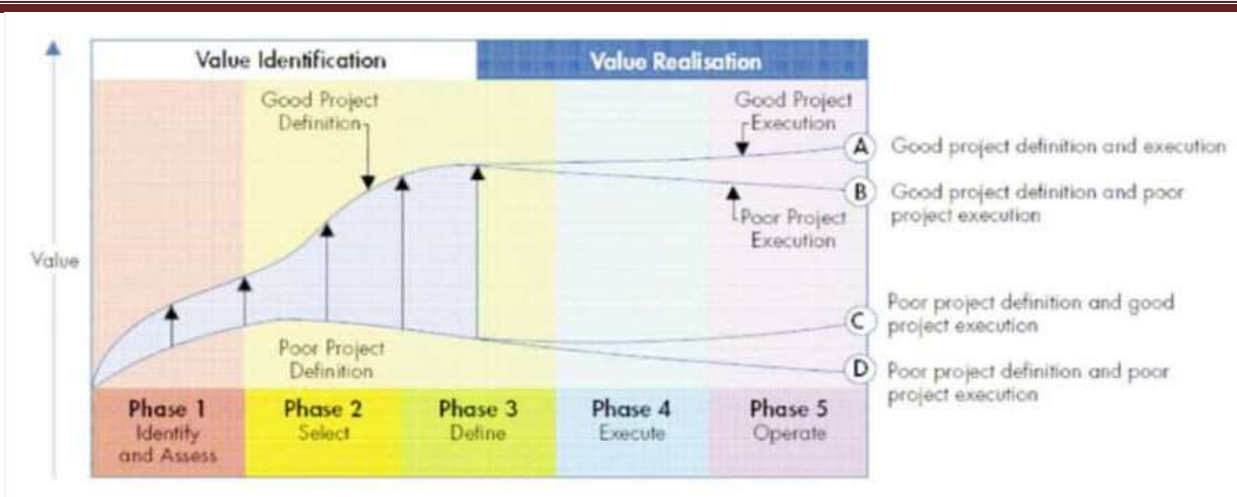

Figure 4: Value Creation in Early Phase (Enwudor, 2024)

2.3 Difference Between FEP and project planning

It is important at this juncture to differentiate between front-end planning and project planning, especially as the two approaches take place early in the project development. Front-end planning covers project conceptualization and part of project planning. Its focus is to define the project for decision, (planning for decision) and its output is final decision on project investment (or not). While project planning is 'preparing for the execution phase' and its output are the 'project plans' to guide project execution (Hansen et al., 2018). Table 1 show other differences between them.

Table 1 Difference between FEP and project planning (Hansen et al., 2018)

S/N	ELEMENT	PROJECT PLANNING	FRONT-END PLANNING
1	Characteristics	Second phase of project life cycle	Initiation phase and part of planning phase
2	Engagement period	From the end of the initiation phase up to the beginning of execution phase	From initiation phase up to a decision to proceed with the project is concluded.
3	Major output	Project plans	Final decision on project investment.
4	Focus	Planning to prepare	Planning to decide
5	Significance	Important to prepare for the next project phase.	Important to restrict the project from wasting time, money and other resources in doing the wrong project.

2.4 The project front-end and front-end planning

Project front-end also known as pre-project (PMI, 2013), project definition (Cano and Lidon,2011), front-end Loading, front-end Engineering design (Feed), conceptual design, Schematic design is part of the early phases (initiation and planning) of the project lifecycle. According to Wang (2002), front-end comprises all the tasks from initiation to the point decision is made to invest on the project. On the other hand, front-end planning is defined by CII (2012) as the process of developing sufficient strategic information for owners to address risk and decide to commit resources to maximize the chance of a successful project. This process encompasses (i) Feasibility (ii) Concept, and (iii) Detailed scope. It is at the front-end and phase of a project that the why, what, when, how, where and who questions about a project are answered (IPSOS, 2009).

Enwudor (2024), posited that front-end planning is "the first phase in project delivery consisting of three modules:

(i) determining purposes (stakeholder needs and values)

(ii) translating those purposes into criteria for both product and process design, and

(iii) generating design concepts against which requirements and criteria can be tested and developed". In the other word, front-end planning or project definition is the alignment of Purpose (Ends), Concept (Means), and Criteria (Constraints). This definition is adopted as a working definition for this study.

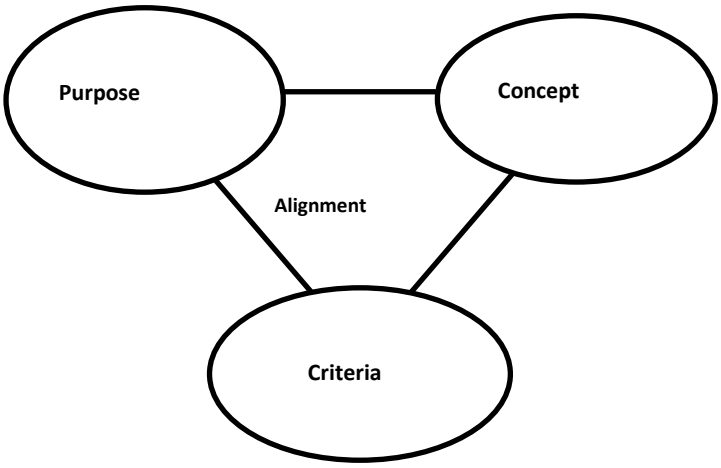

Figure 5: Project definition (Enwudor, 2024)

Furthermore, Wheltons and Ballard (2002) see front-end planning as a "a collaborative process, one in which knowledge is shared and acquired and it significantly relies on the collective knowledge of the individuals", stressing that it is through this collaborative learning that value is created. Learning, according to Enwudor (2024) take place when an organization achieves what is intended, that is when there is a match between intension and outcome, or when a mismatch is identified, corrected and turned to a match. Several authors agree that front-end is a learning process to forge common understanding of the problem, where knowledge is generated and shared (Leyva & Matovic, 2011, Kahkonem, 1999) and subject to politics, social, economic, behavioural and even psychological nature (Egeland, 1999; Winter & Szezpank, 2009). According Enwudor (2024), project definition entails effective communication. Communication refers to the process of sending a message through the exchange of knowledge, information, ideas and feelings through speech, gesture or writing in a vocabulary mutually understood by the parties.

2.5 Significance of project front-end planning

Project front-end planning has been recognized as critical for project success (Morris, 1997, 1998, 2013; Edkins et al., 2012). Morris (1997) pointed out that a project is in great danger if objectives are not clearly defined and strategic planning underdeveloped. To him "early definition stages set the framework" (Morris, 1998), Karkonem (1999) agrees, the author averred that "project definition process has great potential to improve significantly the success of the whole Projects", Wheltons and Ballard (2002) added that 80% of a product can be specified at front-end". Hansen, Too and Le (2018), noted that insufficient FEP will result in: under definition of project, unstable team organization, incomplete project requirements, ambiguous roles and responsibilities, incomplete project plan. These problems will impact project performance resulting to: doing the wrong project, rework will increase schedule and cost overrun and ultimately, schedule and cost overrun and ultimately stakeholders' dissatisfaction

The CII Publication, "*Pre-Project Planning: Beginning the Project the Right Way"* stated that well-planned project can:

- reduce total project design and construction cost by as much as 20% (vs authorization estimate)
- reduce total project design and construction schedule by as much as 39% (vs authorization estimate)
- improve project predictability in terms of cost, schedule and operating performance
- increase the chance of the project meeting environmental and social goals (Bosfield, 2012).

According to Enwudor (2024) choice of concept (solution) which takes place in front-end phase is critical to the overall project success. Several concepts should be identified, evaluated and the best chosen. One unique

benefit of front-end planning is the shaping and refinement (funneling) process. All proposed projects do not just get sanctioned to the traditional project starting phase. Projects are screened analytically and only those that meet requirements are approved for the next stage.

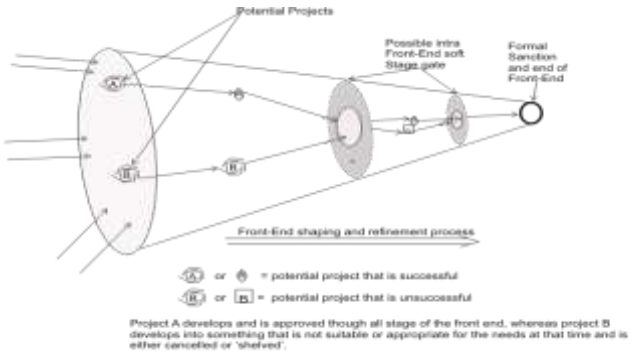

Figure 6: Front-end funneling (Edkins et al., 2012)

Generally, the front-end phase provide opportunity for knowledge, learning and common understanding of problem and possible solutions to it; minimize wastages and failure by ensuring risk elimination or mitigation; and that investment decisions are based on sound judgements in the PESTIE Context. Wrong decisions at the front-end could affect the project negatively in later stages.

3. Methodology

Questionnaire survey was adopted as instrument of data collection for its ease of use, ability to cover a wide range of respondents (Enwudor, 2024), and ease of testing many hypotheses simultaneously. This was complemented by semi-structured interview of design and construction professionals, project managers/team members, contractors and end-users. Furthermore, a case study of end-users was involved in project definition and the researchers personal experience as an architect and project managers with 25 years' experience as public-sector project managers was an advantage. The data collected was analyzed using statistical tools: percentages, frequencies, mean score, standard deviations and other main tools deployed in the framework development. A sample is a subset of these population. They include: architects, builders, project managers (PM), Quantity surveyors, Engineers, Contractors, policy makers/ clients and end-users involved in the conceptualization, design, construction and use of public buildings in the South-south Region

Non-probabilistic sampling method, purposive sampling was adopted for this study. Purposive sampling is very effective when a researcher is studying certain structures or cultural terrain among educated/ informed professionals (Creswell, 2009).

According to Slovin's formula, a sample size can be determined using the equation below for a 94% confidence level.

It is computed as $n = \frac{N}{[1+ N (e)^2]}$

Where:

n = the no. of sample

N= total population

e = error margin

$n = \frac{968}{}$

$[1+ 968 (0.05)^2]$

n = 400

Upon analysing the output, it is evident that a total of 400 questionnaires was distributed to the respondents.

Survey research, case study and field research was discussed and employed in this research. Survey research is the most commonly used research techniques (Neuman, 2003). It is cheap and easy to carry out, often associated with deductive approach. It can generate numerical data about the characteristics of the respondents including their opinions, expectations and knowledge. Survey research can be administered by self, mail, telephone or electronically. However, face-to-face survey encourage higher response rate (Neuman, 2003).

In pursuance of the mix-method strategy adopted for the research, both quantitative and qualitative data were collected. Qualitative primary data were collected through close-ended questionnaires administered on ministry workers concerned with project management, project management practitioners, contractors, consultants and end-users. Semi-structured interviews complemented the questionnaires.

The questionnaire was designed to cover organizational factors such as commitment and institutionalization of stakeholder management, use of stakeholder management framework, project front-end issues; design factors; project leadership factors; quality factors, user satisfaction and ranking of the factors to determine the relative weight of each factors.

The completed copies of the questionnaire were checked for completeness, collated, coded and analyzed using SPSS (V 25). Frequency and percentage was used to analyze the demographic variables. The descriptive statistics of mean and standard deviation was used to analyze research questions. For objective one, identifying factors affecting the front-end, frequency, mean and standard deviation was used for the analysis. While for objective two, identify key factors of the front-end influencing performance of public building projects, factor analysis was used.

4. Results

4.1 Response from questionnaires

Four hundred (400) sets of questionnaires were administered on the respondents. After retrieval and checking, three hundred and seventy-two (372) valid questionnaires were selected for analysis. This represents 93% rate of return which was adjudged appropriate for analysis.

4.2 Demographic characteristics of respondents

Tables 2 to 10 summarizes some of the demographic characteristics of the respondents. Table 2 shows the pedegree of the respondents. They are basically people knowledgeable on the subject matter under investigation. Table 5 Shows that the respondents average industry experience of 24yrs, this length of service makes them grounded in their practices. Table 6 shows that 75% have first degree and above which confirms their level of knowledge and fitness to make informed decisions. Table 3 shows that majority of the respondents are from the environmental disciplines -architects, Quantity Surveyors, Estate Valuers, Land Surveyor. Only 2% are from Project Management Background which confirms the paucity of Professional Project Managers in the public service.

Table 2: Respondents

S/N	Items	Frequency	%	Position
1	Project consultants (Architects, Engineers, Q/Surveyors PMS	156	41.9	1st
2	Stakeholders/Endusers	42	11.3	4th
3	Contractors/Suppliers	37	9.9	4th

4	Project Managers/Project team members	100	26.9	2nd
5	Top government functionaries/NGOs	37	9.9	3rd
		372	**100%**	

Table 3: Age of Respondents

S/N	Items	Frequency	%	Position
1	18-25 years	168	145.2	1st
2	26-35 years	118	31.7	2nd
3	36-45 years	23	6.2	4th
4	46-50 years	36	9.7	3rd
5	50 years and above	27	7.3	5th
		372	**100%**	

Table 4: Industry of Respondents

S/N	Items	Frequency	%	Position
1	Construction Industry	196	52.7	1st
2	Manufacturing industry	51	13.7	3rd
3	NGOs	63	16.9	2nd
4	Public Sector (Government)	22	5.9	5th
5	Academia	40	10.8	4th
		372	**100%**	

Table 5: Industry Experience

S/N	Items	Frequency	%	Position
1	1-5 years	32	8.60	5th
2	6-10 years	43	11.60	4th
3	11-20 years	59	15.90	3rd
4	21-30 years	166	44.60	1st
5	31 years and above	72	19.40	2nd
		372	**100%**	

Table 6: Highest Qualification of Respondents

S/N	Items	Frequency	%	Position
1	Diploma	68	18.30	3rd
2	Professional Qualification	28	7.50	4th
3	First Degree	151	40.60	1st
4	Master Degree	108	29.00	2nd

5	Ph.D Degree	17	4.60	5th
		372	**100%**	

Table 7: Availability of PMP or M.Sc Project Management Certification

S/N	Items	Frequency	%	Position
1	Yes	60	16.13	2nd
2	No	312	83.87	1st
		372	**100%**	

Table 8: Stage of involvement in Projects

S/N	Items	Frequency	%	Position
1	Frontend phase	45	12.10	5th
2	Concept Phase	59	15.90	3rd
3	Planning phase	57	15.30	4th
4	Execution phase	76	20.40	2nd
5	Handing over/Use phase	135	36.30	1st
		372	**100%**	

Table 9: Practice of Front-end Planning

S/N	Items	Frequency	%	Position
1	Yes	20	5.38	2nd
2	No	352	100	1st
		372	**100%**	

Table 10: FEP criticality to Project performance

S/N	Items	Frequency	%	Position
1	Yes	298	80.11	1st
2	No	74	19.89	2nd
		372	**100%**	

4.3 Factors affecting FEP practice

Table 11: Mean and Standard deviation on the factors affecting FEP practice.

Descriptive Statistics						
	N	**Minimum**	**Maximum**	**Std. Deviation**	**Mean**	**Rank**

A responsive building design based on stakeholder's requirement and consensus can create benefits and value for users	372	1.00	5.00	1.49293	2.5161	7th
Lack of patience and advocacy affect effective FEP	372	1.00	5.00	1.24799	2.0215	14th
Lack of group decision – making affect stakeholder collaboration and FEP	372	1.00	5.00	1.37793	2.0833	12th
Most construction professionals of the Niger Delta Region, Nigeria generally lack knowledge of the importance of FEP	372	1.00	5.00	1.26818	2.0296	13th
Clients effective leadership at FEP can enhance the effectiveness of FEP and project success in general	372	1.00	5.00	1.37974	2.3468	9th
Lack of team skill/competence affect FEP	372	1.00	5.00	1.70676	2.5780	4th
Awareness of practice of FEP is low, unstructured, subject to subjective individual professional opinion and ineffective	372	1.00	5.00	1.61138	2.6613	2nd
Poor project conceptualization can lead to loss of benefits and value.	372	1.00	5.00	1.61972	2.5672	6th
Poor scope definition is the main cause of project failure (cost and schedule overrun)	372	1.00	5.00	1.52043	2.6747	1st
Inadequate time allocation for FEP affect FEP processes	372	1.00	5.00	1.34597	2.2312	11th
Lack of fund affects the practice of FEP	372	1.00	5.00	1.45023	2.3011	10th
Project definition of large public building is best achieved by stakeholder's collaboration	372	1.00	5.00	1.37670	2.6452	3rd
Lack of organizational commitment to FEP affect the process	372	1.00	5.00	1.45822	2.5753	5th
Absence of organizational structure affect FEP	372	1.00	5.00	1.55070	2.4516	8th
Valid N (listwise)	372					

The table above presents different items related to FEP practice, showing how construction professionals perceive these items based on their experiences. Each item has a score that indicates how much agreement there is among the professionals regarding that item. A higher mean indicates stronger agreement among the professionals about that particular factor. From the table above, many of the professionals believe that poor

scope definition is the main cause of project failure (cost and schedule overrun) is the main factor affecting FEP practice in the South-South Region, Nigeria, with a mean score of 2.67, which is high, indicating strong agreement.

This is followed by Awareness of practice of FEP is low, unstructured, subject to subjective individual professional opinion and ineffective with a mean score of 2.66 and ranked second. The third is Project definition of large public building is best achieved by stakeholder's collaboration with a mean score of 2.65. This indicates that most professionals strongly agree with this statement. The next item is Lack of team skill/competence affect FEP with a mean score of 2.58 and ranked fourth factor affecting FEP practice in the South-South Region, Nigeria. The others showing agreement in the fifth item is lack of organizational commitment to FEP affect the process with a high mean score of 2.58.

4.4 Factors of front-end influencing performance of public building project

Table 12: KMO and Barlett's Test of factors of front-end influencing performance of public building project

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.798
Bartlett's Test of Sphericity	Approx. Chi-Square	2001.522
	df	253
	Sig.	.000

A principal component analysis was conducted on twenty-three (23) factors of front-end influencing performance of public building projects using IBM SPSS Statistics version 26.0. Prior to this, an evaluation was conducted to determine the appropriateness of the data for analysis. Upon examination of the correlation matrix, it was observed that a considerable number of the coefficients exhibited values of 0.3 or higher. A Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was obtained, with a value of 0.798. The aforementioned value falls within the desirable range of 0.6. According to the results presented in table 4.18, the Bartlett's test of sphericity yielded a value of 2001.522, which was found to be statistically significant at a level of 0.000. The obtained Cronbach's alpha value of 0.844 indicates a satisfactory level of internal consistency and reliability for both the measures and the scale.

Table 13: Communalities for factors of front-end influencing performance of public building project

Communalities		
	Initial	Extraction
Political, social and economic climate	1.000	.595
Legal/regulatory framework	1.000	.719
Corrupt environment	1.000	.712
Organizational culture	1.000	.556
Project management culture	1.000	.774
Project manager/team's competences/skills	1.000	.776
Project team training and development	1.000	.810
Project team motivation	1.000	.750
Stakeholder alignment and collaboration	1.000	.786
Stakeholder communication	1.000	.509
Knowledge sharing and learning	1.000	.697

Group decision-making/dialogue	1.000	.660
Common vocabulary and understanding	1.000	.654
Project requirements	1.000	.798
Quality of project definition	1.000	.567
Use of structured stage-gated process	1.000	.713
Use of value improving practices (VIPs)	1.000	.519
Process integration	1.000	.763
Process coordination and control	1.000	.634
Activity sequencing	1.000	.743
Reliable estimates (time and cost)	1.000	.571
Front end management framework	1.000	.535
Complete scope definition	1.000	.698
Extraction Method: Principal Component Analysis.		

According to table 13, the value of the communality with the highest value was associated with Project team training and development (0.810), while the value of the communality with the lowest value was associated with Stakeholder communication (0.509). Therefore, the extracted communalities provide justification for the application of factor analysis to the variables. The data indicates that all variables meet the criteria for further analysis, as none of them yielded eigenvalues below the 0.50 cut-off point.

Table 14: Total Variance Explained for factors of front-end influencing performance of public building project

Component	Initial Eigen values		
	Total	% of variance	Cummulative %
1	3.381	14.700	14.700
2	2.473	10.753	25.452
3	1.709	7.432	32.884
4	1.669	7.258	40.142
5	1.452	6.313	46.455
6	1.286	5.593	52.048
7	1.171	5.091	57.139
8	1.071	4.656	61.795
9	1.027	4.465	66.260

Table 14 presents the outcome of the analysis, which yielded a nine (9) factor component solution that accounted for a cumulative variance of 66.260%. The initial factor accounted for 14.700% of the variance, followed by the second factor which accounted for 10.753%, the third factor which accounted for 7.432%, and the final and ninth factor which accounted for 4.465%. The cumulative variance accounted for surpasses the suggested threshold of 50% (Sekaran, 2000). The nomenclature of the five components was determined based on the factor exhibiting the greatest loading within the cluster.

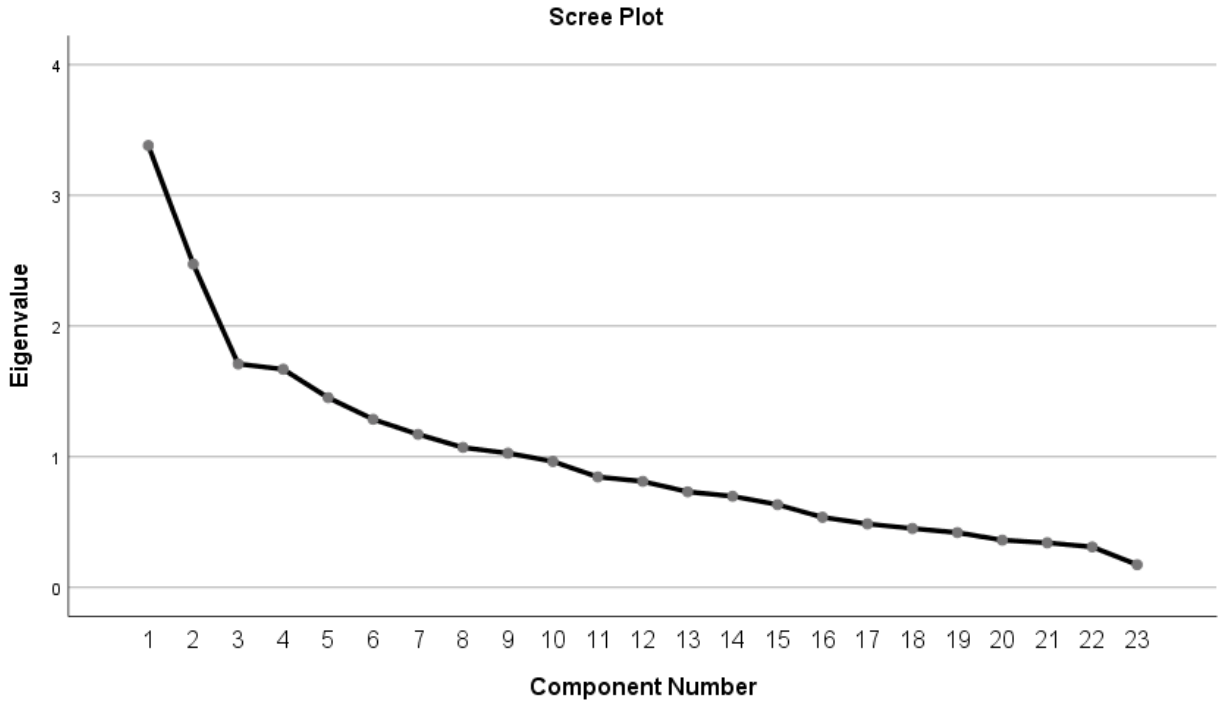

Figure 7: Scree plot for factors of front-end influencing performance of public building project

The responses obtained on the questionnaire scale were subjected to factor analysis with Varimax rotation. Figure 7 shows the scree plot derived from the EFA conducted. The report retains nine (9) factors based on Kaiser's rule which recommends maintaining elements with eigenvalues greater than unity and the fact that the scree plot showed a sharp curve after the ninth to the fourteenth factor. The factors account for over 50% of the total variance explained.

Table 15: Component matrix for factors of front-end influencing performance of public building project

Component Matrix[a]									
	Component								
	1	2	3	4	5	6	7	8	9
Political, social and economic climate	.872								
Legal/regulatory framework	.871								
Corrupt environment	.573								
Organizational culture		.854							
Project management culture		.848							
Project manager/team's competences/skills		.553							
Project team training and development			.788						
Project team motivation			.659						
Stakeholder alignment and collaboration				.808					
Stakeholder communication				.798					
Knowledge sharing and learning				.792					
Group decision-making/dialogue				.560					
Common vocabulary and understanding					.772				
Project requirements					.686				
Quality of project definition					.630				
Use of structured stage-gated process						.791			
Use of value improving practices (VIPs)						.675			
Process integration							.836		

Process coordination and control							.749		
Activity sequencing								.818	
Reliable estimates (time and cost)								.738	
Front end management framework									.746
Complete scope definition									.501
Extraction Method: Principal Component Analysis.									
a. 9 components extracted.									

The rotated component matrix presented in table 15 reveals the existence of nine (9) distinct components, with each variable being primarily associated with a single factor (component). Based on the findings, it can be inferred that certain components may serve as the primary underlying factors that contribute to influencing the performance of public building projects.

Three factors were identified for component one, they include; "Political, social and economic climate, Legal/regulatory framework and "Corrupt environment". In the second component, three factors were identified, they include; "Organizational culture", "Project management culture" and "Project manager/team's competences/skills". In the third component, two factors were identified, they include; "Project team training and development" and "Project team motivation". In the fourth component, four factors loaded. They include; "Stakeholder alignment and collaboration", "Stakeholder communication", "Knowledge sharing and learning", and "Group decision-making/dialogue". In the fifth component, three factors loaded, they include "Common vocabulary and understanding", "Project requirements" and "Quality of project definition". In the sixth, seventh, eighth and ninth, two (Use of structured stage-gated process and Use of value improving practices (VIPs), two (Process integration and Process coordination and control), two (Activity sequencing and Reliable estimates (time and cost)), and two (Front end management framework and Complete scope definition) factors respectively loaded maximally. The numerical values enclosed there in represent the factor loadings which are above the 0.5 threshold.

Discussions

In addressing the first objective of this study, the construction professionals perceived certain items based on their experiences. Each item has a score attached to it indicating how much agreement exists among professionals regarding that item. A higher mean indicates stronger agreement among the professionals about that particular factor. From the findings, most of the professionals believed that poor scope definition is the main cause of project failure (cost and schedule overrun) is the main factor affecting FEP practice in the South-South Region, Nigeria, with a mean score of 2.67, which is high, indicating strong agreement. This finding corroborates the study of Al-Nabae and Samani (2021), Kusters (2016), Xiang et al (2016), Yang (2017) and MacGillivray (2016) who posited that poor scope definition is the main cause of poor building project project performance. This is followed by Awareness of practice of FEP is low, unstructured, subject to subjective individual professional opinion and ineffective with a mean score of 2.66 and ranked second. The state of awareness and deployment of FEP seems to be not encouraging given the outcome of our study. This implies a lot still needs to be done to streamline issues regarding frontend practices in South- South and Nigeria at large. The third is Project definition of large public building is best achieved by stakeholder's collaboration with a mean score of 2.65. This indicates that most professionals strongly agree with this assertion. The next item is Lack of team skill/competence affect FEP with a mean score of 2.58 and ranked fourth factor affecting FEP practice in the South-South Region, Nigeria. The others showing agreement in the fifth item is lack of organizational commitment to FEP affect the process with a high mean score of 2.58.

In addressing the second objective of this study, a principal component analysis was conducted on twenty-three (23) factors of front-end influencing performance of public building projects identified from the literature. Prior to this, an evaluation was conducted to determine the appropriateness of the data for analysis. Upon examination of the correlation matrix, it was observed that a considerable number of the coefficients exhibited values of 0.3 or higher. A Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was obtained, with a value of 0.798. The aforementioned value falls within the desirable range of 0.6. According to the results presented, the Bartlett's test of sphericity yielded a value of 2001.522, which was found to be statistically significant at a level of 0.000. The obtained Cronbach's alpha value of 0.844 indicates a satisfactory level of internal consistency and reliability for both the measures and the scale.

According to the findings, the value of the communality with the highest value was associated with project team training and development (0.810), while the value of the communality with the lowest value was associated with stakeholder communication (0.509). Therefore, the extracted communalities provide justification for the application of factor analysis to the variables. The data indicates that all variables meet the criteria for further analysis, as none of them yielded eigenvalues below the 0.50 cut-off point. The outcome of this study corroborates with that of Wandahl et al (2007) who opined that product value is the client's main requirement on the product which include quality, usability, flexibility, design, price etc while the process value is the cooperation amongst the project stakeholders.

A further analysis and outcome yielded a nine (9) factor component solution that accounted for a cumulative variance of 66.260%. The initial factor accounted for 14.700% of the variance, followed by the second factor which accounted for 10.753%, the third factor which accounted for 7.432%, and the final and ninth factor which accounted for 4.465%. The cumulative variance accounted for surpasses the suggested threshold of 50% (Sekaran, 2000). The nomenclature of the five components was determined based on the factor exhibiting the greatest loading within the cluster.

The rotated component matrix presented revealed the existence of nine (9) distinct components, with each variable being primarily associated with a single factor (component). Based on the findings, it can be inferred that certain components may serve as the primary underlying factors that contribute to influencing the performance of public building projects.

Three factors were identified for component one, they include; "Political, social and economic climate, Legal/regulatory framework and "Corrupt environment". The outcome of this study agrees with that of Samset and Volden (2016) who were of the view that politicians practically dominate project initiation by insisting that whatever project they bring should be done the way they want it without regard to rational analysis. In the second component, three factors were identified, they include; "Organizational culture", "Project management culture" and "Project manager/team's competences/skills". This outcome of our findings corroborates with that of Algahtani et al (2015) who were of the view that project performance is significantly influenced by organisational structures, organisational culture being part of it. In the third component, two factors were identified, they include; "Project team training and development" and "Project team motivation". In the fourth component, four factors loaded. They include; "Stakeholder alignment and collaboration", "Stakeholder communication", "Knowledge sharing and learning", and "Group decision-making/dialogue". In the fifth component, three factors loaded, they include "Common vocabulary and understanding", "Project requirements" and "Quality of project definition". In the sixth, seventh, eighth and ninth, two (Use of structured stage-gated process and Use of value improving practices (VIPs), two (Process integration and Process coordination and control), two (Activity sequencing and Reliable estimates (time and cost)), and two (Front end management framework and Complete scope definition) factors respectively loaded maximally. The numerical values enclosed there in represent the factor loadings which are above the 0.5 threshold.

Conclusion and Recommendations

From the outcomes of the results, the study now concludes that; the factors affecting the front-end of public building projects in South-South, Nigeria includes poor scope definition as the main cause of project failure (cost and schedule overrun), with a mean score of 2.67, awareness of practice of FEP is low, unstructured, subject to subjective individual professional opinion and ineffective with a mean score of 2.66, project definition of large public building is best achieved by stakeholder's collaboration with a mean score of 2.65, lack of team skill/competence affects FEP with a mean score of 2.58 and lack of organizational commitment to FEP affects the process with a high mean score of 2.58. The key factors of the front-end influencing performance of public building projects in South-South Nigeria includes in this order; Political, social and economic climate, organizational culture, Project team training and development, stakeholder alignment and

collaboration, common vocabulary and understanding, use of structured stage-gated process, process integration, activity sequencing, and front-end management framework.

Having gone through the conclusions arrived at, the study recommend as follows; the project frontend as a phase to project closure, the issue of scope should be properly defined from the onset of the building project. All boundaries and limits should be spelt out to avoid scope creep that would eventually lead to building project failure and abandonment. Again, there should be creation of awareness by professional bodies and their association in their annual general meetings (AGM), and other fora where the awareness about frontend as it relates to building projects are raised. This effort would help in disseminating information on its role in building project delivery. Stakeholders engagement and collaboration on building projects is very key in the successful delivery of public building projects. Effective and efficient collaboration by stakeholders should be advocated to help achieve issues bordering on frontend and public building project performance in South-South and the entire Nigeria at large. Public projects are everybody's projects, financed by public resources for public good. This linkage demands that a collaborative culture be fostered. The public client should work to engage project stakeholders early, make the society, end-users part of the decision-making process, and constantly and effectively communicate with them, such communication should be truthful and mutually beneficial.

With regards to socio-economic and political environment, government, professionals and public-spirited individuals should as a matter of necessity accord these key variables all it takes to ensure frontend and its practices are deployed bearing in mind the trio. Politics as we all know has a lot of influence in virtually every facet of our life. If it is not properly given the appropriate consideration, things may not go on well and this would definitely be detrimental to a project. Government must be open to stakeholders on the value, scope and cost of public projects, promote transparency and accountability, check strategies misrepresentation and misappropriate of funds.

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