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A Study of the Critical Success Factors Influencing Projects in the Ghana Public Sector

Dr. Richard Amponsah
Lecturer, GIMPA
Joseph Darmoe
Ph.D Lecturer, GIMPA

Abstract:
Public sector projects are not always implemented successfully in Africa. Both the Government of Ghana (GoG) and donor partners funded projects have reported poor performance and are a disappointment to project stakeholders and beneficiaries. According toIka et al (2010), project failure rate at the World Bank was over 50% in Africa in 2000 and 39% of World Bank projects were also unsuccessful in 2010. It is imperative therefore, to investigate the critical success factors that impact project success in the Ghana Public Service and channel more energy towards these factors in order to reverse this high project failure rate.
This study explored the relationship between critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSFs) for Ghana Public Sector projects and project success. A mixed methodology approach was adopted for the study covering the various departments in Ghana Public Sector. This approach involved the use of both quantitative and qualitative methods of study.Secondary data source was obtained from records of past projects that have been undertaken by Ghana Public Sector. Present and past projects were analyzed to gain a perspective on the project background, strategic objectives and operations. Project evaluation framework was also assessed to compare indicators and targets against achieved value and effectiveness.
Primary data was gathered from structured questionnaires that were administered to selected respondents and was meant to assess the level of awareness of the use of and importance of critical success factors on project performance and its impact on beneficiaries. Extensive interviews were used as a means for collecting primary data from which major findings emerged. Majority of the respondents were males and fell between the ages of 25 and 34 years. The research findings indicated that there is a quite strong positive relationship between project mission, top management support, project schedule and project success. There is also a strong positive linear relationship between client consultation and project success while competent personnel showed a quite weak positive linear relationship with project success. Findings also indicated that there is a strong positive linear association between technical task, client acceptance, communication and trouble shooting and project success. It also showed that there is a fair positive linear association between monitoring and feedback and project success. Clearly, there is a positive linear relationship between the critical project success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's)and project success in Ghana Public Sector.
The study also made some recommendations including the need for Government to organize periodic workshops, seminars and conferences to train and equip Project Managers with the right knowledge, skill sets and competence and the need to provide Project Managers in the Ghana Public Sector with sufficient resources to ensure that public projects achieve better success rates. Finally, it provided insight into policy implications for the Government of Ghana based on the findings and conclusion.

Key words*: Critical Success Factor, Ghana Public Sector*

1. Introducton

1.1. Background

Public sector projects are not always implemented successfully in Africa. Both the Government of Ghana (GoG) and donor partners funded projects have reported poor performance and are a disappointment to project stakeholders and beneficiaries. These have become the rule and not the exception in contemporary reality. According to Ika et al (2010), project failure rate at the World Bank was over 50% in Africa in 2000 and 39% of World Bank projects were also unsuccessful in 2010.

Problems arise most often when stakeholder input is lacking, project phases are separated, optimistic assumptions are made, objectives are not clear, and interaction is restricted rendering continuous sponsorship difficult in most cases. Most donor partners have stringent support criteria that is challenging in nature and demands sufficient prove for project success implementation

especially in the Ghana Public Sector project implementation. Continuous support for project sponsorship from donor partnersare based on management review of sponsored projects resulting inincreasing, aborting or scaling down funds after project supervision reports are produced on project outcomes.

A positive note is that there is an increasingly growing trend in the Public Sector of Ghana where public sector organizations treat their normal operations as projects and leverage on project management tools and techniques. The use of project management processes by public sectors organizations in undertaking projects is becoming a way of working rather than simply a methodology or set of tools. The concept of project management is characterized by new methods of restructuring management and adapting special management techniques, with the purpose of obtaining better control and use of existing resources. For most projects funded by donor partners such as the World Bank, European Union etc. adherence to appropriate project management processes is invariablyinherent in their conditions and requirement which is positive for the recipient countries. Project performances have been challenged, expectations have not been met and causes are often assigned to varied reasons. It is imperative therefore, to investigate the critical success factors that affect projects so as to channel more energy towards them.

The research work of Pinto and Slevin (1987) proposed a solution to the project success challenges by advancing the use of critical success factors (CSFs) in project implementation to improve the downward trend in project performance and stakeholder's satisfaction. Although Belassi and Tukel (1996), argues that CSFs have different relative importance across different industries, Pinto and Slevin (1987) developed a set of empirically derived ten (10) critical success factors (CSFs) general enough to be applied across a variety of organizations and project types.

This paper aims to examine the relationship between these critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSFs) for Ghana Public Sector projects and project success.

1.2. Significance of the Study

The strategic role of the Ghana Public Sector in the development of Ghana demands reliable and efficient research information for decision making but recent misunderstandings have put the sector under pressure from stakeholders. While many Public organizations in Ghana can claim to do good project management, few can provide evidence for the use of a formal project management methodology; used in a consistent, predictable and reliable manner to stakeholders.

Lack of consistent well defined project critical success factors may result in duplication of efforts that impact the bottom line of the organization's development goals; this causes additional costs, increases risks and reduces the trusts donors and stakeholders have in the organization.

The importance of this study would help the sector to overcome these challenges through the continued application of, and adherence to the use of critical success factors in the following ways:

- Adherence to the factors that enhances project success will enable GPS to prevent the poor project management, maintain donor confidence and assistance and prevent undue mistrust in the management of the economy.
- It will offer practical recommendations on areas to explore to further enhance project success, minimize project failures and help boost stakeholder's confidence in future projects.
- Public institutions that are not using project management methodology with its success factors in the execution of their projects can benefit from this research and follow the recommendations to develop and manage their Critical Success Factors.

Beyond these, the study would contribute to available literature in the field of project management in the public sector of developing nations. The practical realities would be laid bare and other researchers interested in the subject matter could further explore the details.

1.3. Objectives of the Research

The broad objective of this research is to develop an understanding of the factors influencing project management success in Ghana Public Sector (GPS), with the following specific objectives:

- Assess the relationship between critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSFs) for Ghana Public Sector projects and project success.
- Provide recommendations that would ensure continuous success of project implementation in Ghana Public Sector.

1.4. Research Question and Hypothesis

The following research question guided the proposed study:

- Is there a significant relationship between project critical success factors (base on Pinto and Slevin, 1987: Project Implementation Profile CSF's) for Ghana Public Sector project and project success?

The research also sought to support this primary question by investigating the relationship that the ten (10) Critical Success Factors have with successful project implementation. The following hypotheses were used to test the research question:

1.5. Hypotheses

- **H_0:** There is no significant relationship between Project critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) for Ghana Public Sector project and project success.
- **H_1:** There is a significant relationship between project critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) for Ghana Public Sector projects and project success.

The Null Hypothesis

H_0: $b_1 = b_2 = b_3 = b_4 = b_5 = b_6 = b_7 = b_8 = b_9 = b_{10} = 0$

The Alternate hypothesis

H_1: At least one of the coefficients (critical success factor) is not zero

Model specification:

The linear regression equation on the effect of critical success factor on project performance is stated as:

$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10}$

Where:

Y = project success

The coefficients of the critical success factors are:

- a = Constant
- b_1= Project Mission
- b_2= Top Management support
- b_3= Project Schedule/plan
- b_4= Client Consultation
- b_5= Competent personnel
- b_6= Technical tasks
- b_7= Client acceptance
- b_8= Monitoring and feedback
- b_9= Communication
- b_{10}= Trouble-shooting

2. Literature Review

Project management principles have become one significant tool used by institutions as the best means of offering competitive products or services to their stakeholders in today's competitive market place. According to Stevenson (2009), project is a unique, one- time operations designed to accomplish a specific set of objectives in a limited time frame. The project management institute (2008) further observed the characteristics of project to include: (a) A temporary endeavor; (b) Creation of a unique product; (c) Definite beginning and end; (d) Limited budget and performance constraint. Cleland and Ireland (2007) noted that projects are embarked on to implement organizational strategy, achieve enterprise goals and objectives, and contribute to the recognition of the organization's mission.

2.1. Project Management

Project management principles are means to achieve a set of business objectives more efficiently and effectively. Organizations may decide to apply the project management principles; application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project (Project Management Institute 2008). It highlights in details, the tools and techniques that are required to define, plan, and implement any project (Murphy and Ledwith 2007).

Application of the project management principle is characterized by methods of restructuring management and adapting special management techniques, with the purpose of obtaining better control and use of existing resources and steps that ensure it is successfully managed to achieve project success (Gray and Larsson, 2006).

Baccariani (1999) proposes a set of dimensions for defining and measuring project success. He proposes a comprehensive model of project success by merging the success dimension to the information system and the Project management streams to assist project managers to assess the likely success of a project early in the development.

2.2. Project Failures

Project failures continue at an alarming rate, despite growing understanding of determinants of success in project management. According to the "CHAOS Summary 2009" study from the Standish Group there is a downward trend in project success rates with more project failures (Table 1). The study identified top five causes for failed projects that include:

- Incomplete Requirements
- Lack of User Involvement
- Lack of Resources
- Unrealistic Expectations
- Lack of Executive Support

(Project outcome)	1994	1996	1998	2000	2002	2004	2009
Succeeded	16%	27%	26%	28%	34%	29%	32%
Challenged	53%	33%	46%	49%	51%	53%	44%
Failed	31%	40%	28%	23%	15%	18%	24%

Table 1: Projects failure
Source: The Standish Group "CHAOS Summary 2009"

The disturbing conclusion from report (2009), detailed in (fig 1), is that only 32% of projects were successful; 44 percent were challenged or partial failures; and 24% were complete failures. The failure rate increased from 18% in 2004.
With such high failure rates, some mechanism is needed to mitigate the risk of failure and to ensure the success of projects. Having a set of well-defined critical success factors (CSF) is one such solution. A prior thorough understanding of the CSFs related to project implementation would considerably increase the chances of successful project implementation.

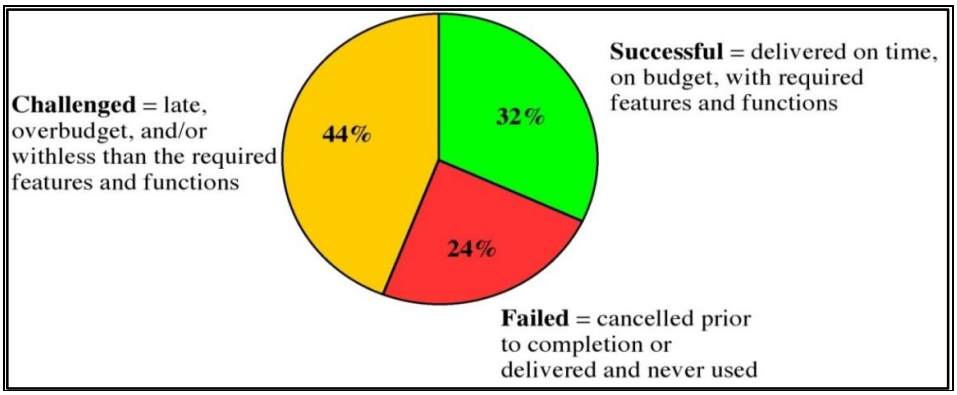

Figure 1: Project outcome 2009
Source: The Standish Group "CHAOS Summary 2009"

2.3. Project Success Factors
Effective project management is critical to the success of every organization. Over the last few decades, modern businesses around the world have developed new success factors in coordinating project management activities across all parties and stakeholders. These tools have been used as set of strategic strengths that are key to the environment and industry in which they operate (Ansoff, 1965; Andrews, 1971; Porter, 1980 cited in Dvir et al, 1998).
The findings of Aksorn and Hadikusumo (2008), suggested that the concept of critical success factors (CSF) was made popular by Rockart in 1979. The findings of his study defined critical success factors as "those characteristics, conditions or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in particular industry".
Pinto and Slevin (1987) also defined critical success factors from project point of view as the core elements that are vital for a strategy to be successful. Their definition includes: "factors which, if addressed, significantly improve project implementation chances". These elements of a project that can be influenced to increase the likelihood of success; these are independent variables that make success more likely (Muller and Turner, 2007).
Few years later, Rungasamy et al. (2002) also added that it will be difficult to achieve program success if the critical success factors are not managed well. It is important, therefore, for organizations to know the key areas where satisfactory performance is required for the organization to achieve its intended goals to gain competitive advantage and also develop tools for effective troubleshooting should there be any errors.

2.4. Criteria to Measure Project Success
Project success criteria are key performance indicators that measure the successful outcome of a project; these are dependent variables which measure project success (Muller and Turner, 2007). According to Pandremmenou et al (2013), an attempt to define project success was made in the 1960's and was restricted to the time, cost and quality (the iron triangle). This criterion used to measure project success was proven to have stood the test until Atkinson (1999) challenged the status quo in his research.
Atkinson (1999) argued that modern day projects managers are expected to deliver results quickly and those results are measured as soon as possible but not against failed measurements like time, cost and quality (iron triangle). He proposes a new way to consider success criteria, called the Square Root. The square root consist of additional element like Information system; benefit (Organizational) and benefits (stakeholders).

2.5. Critical Success Factors Lists

By extending this measurement criteria, Atkinson (1999) opened the research channel for further concepts such as: the effectiveness of administration of project management processes, the customers' satisfaction of project's deliverables, the creation of adding value to the enterprise, the meeting of stakeholder's satisfaction and the achievement of scope of the project (Freeman & Beale, 1992, Jonas, 2010, Lock, 2007, as cited by Pandremmenou et al (2013) were added.

In their empirical research, Pinto and Slevin (1987) developed a collective set of CSFs related to project implementation success in 1986. Their study on project implementation profile (PIP) model identified ten critical success factors related to project implementation success. The ten factors were:

- Project Mission: Initial clarity of goals and general directions;
- Top Management Support: Willingness of top management to provide the necessary resources and authority/power for project success;
- Project Schedule/Plans: A detailed specification of the individual action steps required for project implementation ;
- Client Consultation: Communication, consultation, and active listening to all impacted parties ;
- Personnel: Recruitment, selection, and training of the necessary personnel for the project team;
- Technical Tasks: Availability of the required technology and expertise to accomplish the specific technical action steps;
- Client Acceptance: The act of "selling" the final project to its ultimate intended users;
- Monitoring and Feedback: Timely provision of comprehensive control information at each stage in the implementation process;
- Communication: The provision of an appropriate network and necessary data to all key actors in the implementation;
- Trouble-Shooting: Ability to handle the unexpected crises and deviations form plan.

Although these 10 critical success factors create a measurement platform for the project manager to identify aspects of a project that determines it success, Pinto and Slevin (1987) did not fully investigate changes in the importance of these factors at different phases of the project life cycle.

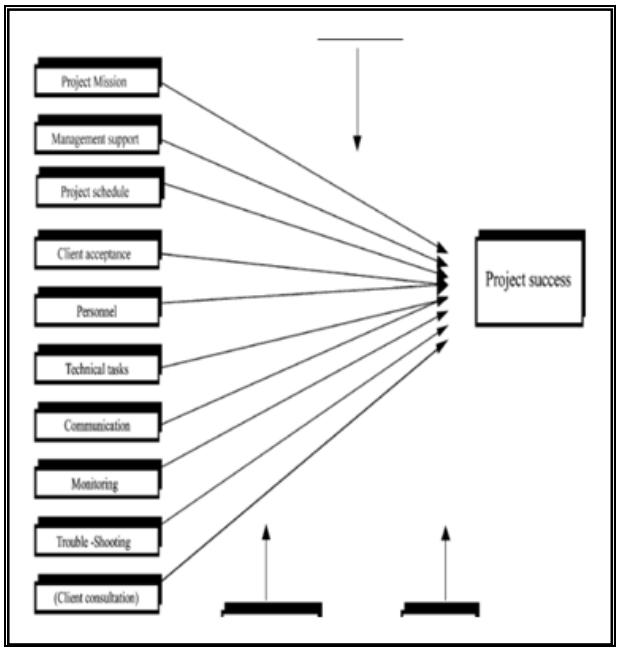

Figure 2: Project implementation profile (PIP) model
Source:Pinto, J. K., and Slevin, D. P., 1987. Critical Factors in Successful Project Implementation. IEEE Transactions on Engineering Management

3. Methodology

A mixed methodology approach was adopted for the study covering the various departments in Ghana Public Sector. This approach involves the use of both quantitative and qualitative methods of study. Quantitative methods focus on the importance of numbers and identification of causal relationships. Qualitative methods on the other hand permit the researcher, to study selected issues, cases, or events in depth and detail.

3.1. Sources of Data

Two types of data collection sources were used, namely primary data and secondary data.

Secondary data source was obtained from records of past projects that have been undertaken by Ghana Public Sector. Present and past and projects were analyzed to gain a perspective on the project background, strategic objectives and operations. Project evaluation framework was also assessed to compare indicators and targets against achieved value and effectiveness.
Secondary data was used to support the primary data mainly in reviewing literature and in comparing findings of the study to findings by other researchers.
Primary data was gathered from the use of structured questionnaires that were administered to selected respondents and was meant to assess the level of awareness of the use and importance of critical success factors on project performance and its impact on beneficiaries.
The interview is also chosen as the means for collecting primary data from which major findings emerge.

3.2. Population Size
The respondent consists of personnel directly connect to project management (Senior Management, Middle Management, and Junior Management) in Ghana Public Sector.

3.3. Sampling Technique and Sample size
Purposive technique was used for this study as the targeted sample needs to have working knowledge of project management. A total of 215 questionnaires were completed (86 per cent response rate) by the target personnel in Ghana Public Sector (GPS). This response was out of an approximate total population of 250 respondents. During collection of data anonymity of respondents was assured.

3.4. The research instruments
This study employed structured questionnaire built on (Pinto and Slevin, 1987: Project Implementation Profile CSFs) model as the main research instrument. The framework consisting of the independent variables were derived from Pinto (1986) Project management Profile (P.I.P) depicted in Fig 3. The ten (10) Project Critical Success factors were used as the moderating variable with the project success as the dependent variable to study how the critical success factors, in practice, directly affect project success or failure in Ghana Public Sector.

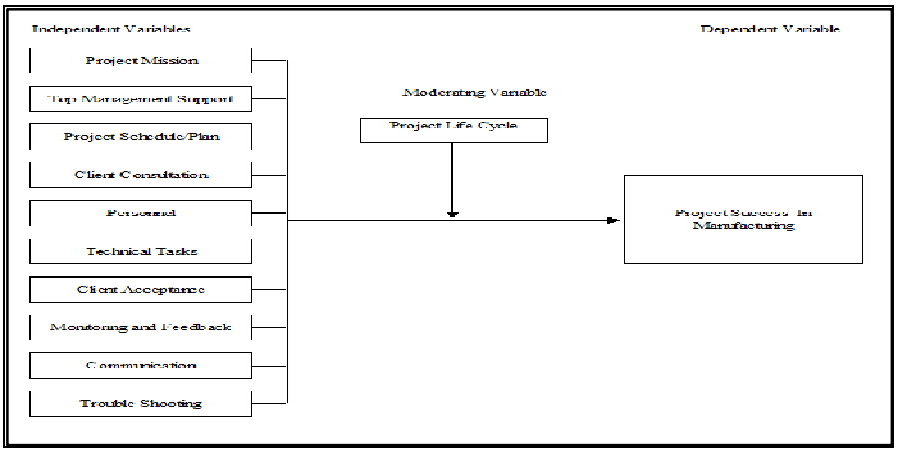

Figure 4: Relationship between critical success factors and project success

3.5. Pre-test
The questionnaire was pre-tested by means of a pilot study, which found the questionnaire to be valid from a content perspective. Having confirmed the validity of the questionnaire, the target audience within Ghana Public Sector was defined and the questionnaire distributed by hand.

3.6. Data Analysis
In assessing the measurable elements of the hypothesis; that is whether there is no significant relationship between Project critical success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) for Ghana Public Sector project and project success, data set were collected from survey and analyzed using the computer software Statistical Package for Social Science for processing and interpretation of results.

4. Presentation, Analysis and Discussion of Results
The data was collected with a structured questionnaire having ten modules of critical success factors and one project success module. Each of the critical success factors had five questions and the project success module had four questions. All the responses were graded by the Likert scale, (from 1strongly disagree to 7 strongly agree). The responses were then summarized into one field for each module by taking a simple average of the responses and rounding up to the nearest whole number. The data capture, processing and the analysis were done using Statistical Package for Social Scientists (SPSS version 16.0).

The analysis looks at a brief background of the staff, frequency distribution of the various project success factors, the correlation between the predictor factors and the response factors, regression analysis of the success factors and a test of the hypothesis.

4.1. Sex Distribution of Respondent

The sex of respondents as shown in figure 5 was to obtain the sex of staff with respect to the implementation of projects in the Ghana Public Sector (GPS).

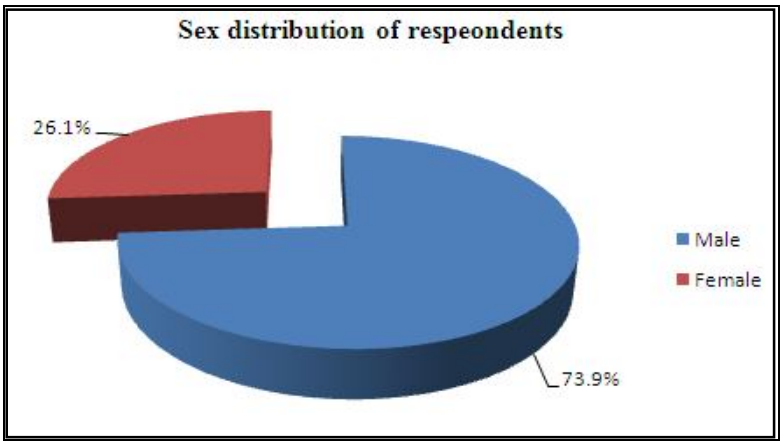

Figure 5: Sex Distribution of Respondent
Source: Fieldwork, 2013

The gender distribution shows 73.9% for male and 26.1 percent for female respectively. The result shows male dominance in projects implementation in the GPS. There is the need for Ghana Public Sector to encourage more female participation in project management.

4.2. Age Distribution of Respondent

The ages of respondents as shown in Table 3 were obtained to ascertain the calibre of the staff with respect to age and its implications for project implementation at the Ghana Public Sector. For the purpose of easy analysis, the ages were categorised into four: staff between the ages of 25 and 34years, those between 35 and 44years, those between 45 and 54years and those above 55years. The age categorisation was applied to both Top Management, Middle Management and Junior staff of the Service and was purposely used to represent the older working staff, the middle aged and the younger staff, as far as public working age is concerned (18- 60).

Age	Frequency	Percent
25-34 years	98	45.6
35-44 years	54	25.1
45-54 years	48	22.3
>=55 years	15	7.0
Total	215	100

Table 4:Age Distribution of Respondent
Source: Fieldwork, 2013

The statistics from above shows that for the project management personnel, ninety-eight (98) out of the 215 respondents (45.3%) were between 25-34 years of age, and 54 (25.1%) were aged between 35-44 years. Those who were 55years and above were 15 (7.0%), the modal age is between 25-34 years which indicates a relatively young workforce in the GPS. This modal age, coupled with continuous training represents a good future for project implementation success in Ghana Public Sector.

4.3. Distribution of Respondent by years of experience in project management

This research also considered the experience of GPS staff in project management since it plays an important role in project implementation. The data, table 2, indicates that those who have less than one year experience in project management represents 1.4 percent and twenty seven (27) respondents (39.1 %) have been in project management between eleven to fifteen years. The data show that Ghana Public Sector has experience project management personnel which is represented by eleven staff with twenty one years (21) and above in project management.

Years of experience in project management	Frequency	Percent
Less than 1 year	18	8.4
1-5 years	28	13.0
6-10 years	42	19.5
11-15 years	56	26.0
16-20 years	38	17.7
21 and above years	33	15.4
Total	**215**	**100**

Table 5:Distribution of Respondent by years of experience in project management
Source: Fieldwork, 2013

4.4. Distribution of Respondent by Level of Education
Furthermore, the research sought to find out the level of education of respondents as described in fig 7.

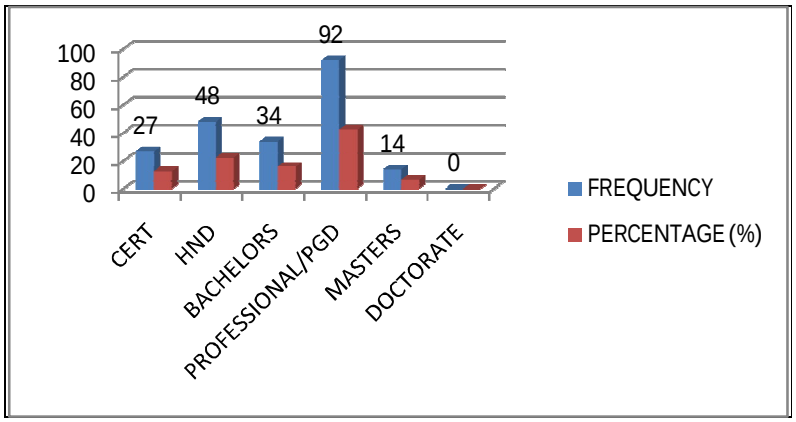

Figure 7: Distribution of Respondent by Level of Education
Source: Fieldwork, 2013

The statistics show that 14 out of the 215 respondents (6.6%) hold Master's degree in various fields of Specialization whereas 34 respondents (15.9%) have Bachelor's degree with the largest of 92 (42.4%) obtaining either postgraduate certificate or professional certificate. None had a doctorate degree.
The implication of this result is that a higher percentage of respondent in project management positions considered for this research have the educational background and the qualification. The responses can be inferred to be a useful reflection from qualified respondent in project management.

5. Statistical Analysis of Project Critical Success Factors

5.1. Correlation and Regression Analysis
A Pearson product-moment correlation coefficient was computed to assess the relationship between the ten critical success factors and project success in the Ghana Public Sector. Table 6 establishes that there is a positive linear relationship between five critical project success factors and project success.
The table 6 indicates that there is quite strong positive linear relationship between project mission, top management support, project schedule and project success. The table 6 also shows that there is a strong positive linear relationship between client consultation and project success while competent personnel showed quite weak positive linear relationship with project success.

		Project Success
Project mission	Pearson Correlation	0.56**
	Sig. (2-tailed)	0.00
Top management support	Pearson Correlation	0.56**
	Sig. (2-tailed)	0.00
Project Schedule/Plan	Pearson Correlation	0.58**

	Sig. (2-tailed)	0.00
Client Consultation	Pearson Correlation	0.81**
	Sig. (2-tailed)	0.00
Competent Personnel	Pearson Correlation	0.40**
	Sig. (2-tailed)	0.00
	N	215

Table 6: Correlation between project success and project mission, top management support, project schedule, client consultation and competent personnel
***. Correlation is significant at the 0.01 level (2-tailed)*

Regression Analysis was used to gain the acceptance value to determine the hypothesis as stated before. It was carried out to test the relationship between the independent variables of project mission, top management support, project schedule/plan, client consultation, competent personnel against the dependent variables of Project success.
The correlation coefficients of the responses showed a positive linear relationship between these critical project success factors and project success in Ghana Public Sector. Further information gathered on competent personnel indicated that the personnel may be competent but the level of commitment most often supersedes personnel competence in the Service. This explains the quite weak relationship between personnel competence and project success in the Service. The result of regression analysis is tabulated in Table 6.
Further information obtained on client consultation indicated that projects carried out in the sector are mainly client oriented, producing data for clients use. This explains the strong positive linear association between client consultation and the success of the projects carried out in GPS.

		Project Success
Technical Task	Pearson Correlation	0.73**
	Sig. (2-tailed)	0.00
Client Acceptance	Pearson Correlation	0.73**
	Sig. (2-tailed)	0.00
Monitoring and Feedback	Pearson Correlation	0.51**
	Sig. (2-tailed)	0.00
Communication	Pearson Correlation	0.75**
	Sig. (2-tailed)	0.00
Trouble Shooting	Pearson Correlation	0.68**
	Sig. (2-tailed)	0.00
	N	215

Table 7: Correlation between project success and technical task, client acceptance, monitoring and feedback, communication and Trouble shooting
***. Correlation is significant at the 0.01 level (2-tailed).*

Table 7 is a continuation of table 6 above. The table indicates that there is a strong positive linear association between technical task, client acceptance, communication and trouble shooting and project success. It also shows that there is a fair positive linear association between monitoring and feedback and project success.
Clearly, all the coefficients of correlation obtained in the analysis indicates, as presented in the tables 6 and 7, that there is a positive linear relationship between the critical project success factors and project success in Ghana Public Sector. However, there were variations in the degrees of the positive linear associations among the critical project success factors.

5.2. Model Determination and Hypothesis Testing

Model	Model Summary			
	R	R Square (R^2)	Adjusted R Square	Std. Error of the Estimate
1	0.883	0.780	0.741	0.445

Table 8: Model summary of the project success factor and project success

From table 8, the overall coefficient of correlation (R = 0.883) indicates a very strong positive linear relationship between the multiple critical project success factors and project success. This indicates clearly that there is a strong direct relationship between these critical project success factors GPS applies in running its projects and the success of the projects.
The overall coefficient of determination (R square/ R^2 = 0.780) also indicates that 78 per cent of the variability in the success of the projects carried out in GPS is explained or accounted for by the variability in these ten(10) critical project success factors applied in the Service.

5.3. The Regression Equation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.562	.759		2.058	.044
	Project mission	0.064	.136	.046	.471	.640
	Top management support	-0.007	.133	-.006	-.053	.958
	Project Schedule	-0.195	.095	-.232	-2.064	.044
	Client Consultation	0.337	.095	.496	3.546	.001
	Personnel	0.105	.102	.081	1.023	.310
	Technical Task	0.086	.151	.091	.568	.572
	Client Acceptance	0.041	.083	.057	.492	.624
	Monitoring and Feedback	-0.047	.131	-.041	-.359	.721
	Communication	0.203	.068	.317	2.966	.004
	Trouble Shooting	0.230	.122	.195	1.883	.065

Table 9: Coefficients of the model establishing the relationship between project success factors and project success

The regression analysis (table 8 above) was used to gain the acceptance value to determine the hypothesis.
The estimated multiple linear regression equation of the effect of critical success factor on project performance is stated as:
$\hat{Y} = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10}$
Where:
$\hat{Y}$ = Project Success.
The critical success factors:
a = Constant, b_1= Project Mission, b_2= Top Management Support, b_3= Project Schedule/Plan,
b_4= Client Consultation, b_5= Competent Personnel, b_6= Technical Tasks, b_7= Client Acceptance,
b_8= Monitoring and Feedback, b_9= Communication and b_{10}= Trouble-Shooting.
The estimated linear regression equation of the effect of critical success factor on project performance is stated as
$\hat{Y} = 1.562 + 0.064X_1 – 0.007X_2 – 0.195X_3 + 0.337X_4 + 0.105X_5 + 0.086X_6 + 0.041X_7 – 0.047X_8 + 0.203X9 + 0.230X10$

5.4. The Test of Hypothesis
H_0: There is no significant relationship between Project Critical Success Factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) and Project Success in Ghana Public Sector.
H_1: There is at least one significant relationship between Project Critical Success Factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) and Project Success in Ghana Public Sector.
Alternatively, the hypothesis is stated as:
The null hypothesis
H_0: $b_1 = b_2 = b_3 = b_4 = b_5 = b_6 = b_7 = b_8 = b_9 = b_{10} = 0$
The alternate hypothesis
H_1: At least one of the coefficients (critical success factor) is not zero
The level of significance for the test of hypothesis is 0.05 or 5 per cent. This indicates the critical region for the hypothesis and if P-value <= 0.05 then the null hypothesis (H_0) is rejected and the alternate hypothesis (H_1) is accepted. Analysis of variance was further used to test the hypothesis.

5.5. Analysis of variance within project success

The analysis of variance (ANOVA) in the table 9 presents the values of the test statistics for the overall hypothesis testing.

	ANOVA				
Model	**Sum of Squares**	**Degree of freedom**	**Mean Square**	**F**	**Sig. (P-Value)**
Regression	40.535	10	4.053	20.505	0.000
Residual	11.465	204	0.198		
Total	52.000	214			

Table 9: Analysis of variance within project success

From the table, the P-Value = 0.00 <= 0.05 (the significance level) therefore we reject the null hypothesis (H_0) and conclude that there is a significant positive linear relationship between the ten (10) critical project success factors and project success as carried out by the Ghana Public Sector.

We can conclude that the coefficient of the project critical success factor (CSFs) is positive and it is significant at 0.05. This indicates that an increase in the use of the ten (10) project critical success factors will increase project implementation success significantly in Ghana Public Sector.This calls for the continuous use of CSFs as an assessment tool for project implementation.

6. Summary of Findings, Conclusion, Recommendations and Policy Implications to Government of Ghana

6.1. Summary of Findings

Findings show that majority of the respondents were males as compared to females. This indicates a low level of participation by females in project management in the Ghana Public Sector. Also, most of the respondents who participated in the research were between the ages of 25 and 34 years and this indicates that most participants engaged in project management in GPS are young. Interestingly, the research findings reveal that most respondents have experience in managing projects ranging from 6 to 15 years. This shows that Ghana Public Sector has personnel with the needed project management experience to improve project success rates. Majority of the participants hold post graduate or professional certificates followed by those with HND and bachelor degrees. This indicates that the participants are well-educated and this authenticates the survey results further.

The research findings also indicate that there is a quite strong positive relationship between project mission, top management support, project schedule and project success. There is also a strong positive linear relationship between client consultation and project success while competent personnel showed a quite weak positive linear relationship with project success.

Further information gathered on competent personnel indicated that the personnel may be competent but the level of commitment most often supersedes personnel competence in Ghana Public Sector and this explains the quite weak relationship between personnel competence and project success in the Service.

Also, additional information obtained on client consultation indicates that projects carried out in the sector are mainly client-oriented, producing data for clients use. This explains the strong positive linear association between client consultation and the success of projects carried out in Ghana Public Sector.

Findings further indicate that there is a strong positive linear association between technical task, client acceptance, communication and trouble shooting and project success. It also shows that there is a fair positive linear association between monitoring and feedback and project success. Clearly, there is a positive linear relationship between the critical project success factors (based on Pinto and Slevin, 1987: Project Implementation Profile CSF's)and project success in Ghana Public Sector. There is a strong direct relationship between these critical project success factors GPS applies in running its projects and the success of the projects.

We therefore reject the null hypothesis (H_0) and conclude that there is a significant positive linear relationship between the ten (10) project critical success factors and project success as carried out by the Ghana Public Sector. In conclusion, an increase in the use of the ten (10) project critical success factors will increase project implementation success significantly in Ghana Public Sector.This calls for the continuous use of CSFs as an assessment tool for project implementation.

7. Conclusion

The findings have been able to achieve the objectives of the study and it can be concluded that there is a strong positive relationship between the ten (10) Critical Success Factors(based on Pinto and Slevin, 1987: Project Implementation Profile CSF's) for Ghana Public Sector project and project success. However, there were varying degrees of relationship strength between the various critical success factors and project success in GPS. Client consultation, technical task, client acceptance, communication and troubleshooting showed a very strong positive association with project success. Project mission, top management support, project schedule/plan and monitoring and feedback showed a quite strong positive relationship with project success while competent personnel displayed a weak positive relationship.

In addition, project management is dominated by males in the Ghana Public Sector as shown by 73.9% of respondents in the study being male.Also, majority of personnel working on projects in Ghana Public Sector are well-educated and have the experience in project management to cause a significant increase in the percentage of successful projects in the Service. Majority of people

involved in project management in the Ghana Public Sector are young and this provides an opportunity to build and develop them with the requisite skills and knowledge to ensure that more projects in GPS are successful.

8. Recommendations

After realizing the goals and objectives of the study, the study recommends the following;

- That in the management of all projects in the Ghana Public Sector, there should be a consideration of all the relevant critical success factors to ensure that public project success rate increases significantly.
- That during project implementation in the public sector, project managers must continually monitor and compare critical success factors considered during project planning phase and achievement of these critical success factors along the project life cycle and take corrective actions to eliminate or reduce variances.
- To change the weak positive relationship between personnel competence and project success in Ghana Public Service, periodic workshops, seminars and conferences should be organized to train and equip project managers with the right knowledge, skills set and competence.
- That project managers in Ghana Public Sector should be provided with sufficient resources (human capital, equipment and materials) to ensure that public projects achieve better success rates.
- That in order to improve the weak positive relationship between personnel competence and project success, personnel involved in project management in Ghana public Service should be motivated enough to guarantee their commitment to ensure public project success rates increase and this must be done through top management showing strong leadership and support for achieving these critical project success factors in public projects.
- That lessons learned from completed projects should be well documented to build up the Organization Process Assets of the Ghana Public Sector. By referring to these assets, project managers will avoid repeating mistakes made on past projects and hence enhance public project success rates.
- That the Project Management Office (PMO) of Ghana Public Service should look out for and select personnel with Project Management Professional (PMP) certification to implement projects in the service.
- That top management embarks on affirmative action drives and institutes policies that will encourage more females to participate in projects in Ghana Public Service.
- Project management has become the standard way of doing things in today's global and competitive world therefore Educational Institutions must set the agenda for project management training at the secondary and tertiary levels. The Ministry of Education should enact an act to include the learning of project management in the curricular of secondary and tertiary cycle institutions.

9. Policy Implication to Government of Ghana

This section provides an analysis of policy implications to the Government of Ghana based on study findings and recommendations:

- The Government should craft and implement policies that encourage female participation in project management in the Ghana Public Service so that women in the Service can develop into seasoned Project Management practitioners and professionals.
- The Government of Ghana should implement policies that require extensive and proper consultation with stakeholders especially clients and donor partners to ensure that critical success factors for project success are clearly defined and agreed upon by all parties before government projects are implemented.
- The Government of Ghana has to set the agenda for training of project management for Project Management practitioners in the Ministries, Departments and Agencies (MDAs). A key aspect of the training should focus on the critical success factors that impact project success in the Ghana Public Service. This is essential because in today's world Project Management is used as a vehicle to drive the developmental aspirations of emerging economies like that of Ghana.
- The Government of Ghana should be very particular about people who manage projects and make sure that government projects of certain magnitudes are given to only people qualified in Project Management and have PMP certification.
- The Government must design and implement policies that ensure that before public sector project implementation authorization is granted, there are defined monitoring and evaluation procedures to measure the attainment of project objectives and achievement of critical success factors.
- Government should also institute policies that ensure that Project Managers, Project Teams and project participants are rewarded both intrinsically and financially when critical project success factors are achieved and projects are successful in the Ghana Public Service.
- There must be sufficient allocation of resources for projects before they are implemented in Ghana Public Service to improve attainment of critical project success factors and hence project success.
- Government policies must be crafted and implemented to ensure project continuity irrespective of change in political parties so as to ensure that critical success factors are attained and public projects are successful.

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