Original Article

An Evaluation into the Factors Influencing Project Harmony Potential in Construction Projects in Kenya.

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ABSTRACT

Construction projects are widely fraught with conflicts probably as a result of their unpredictability, intricacy, and heterogeneity of players. The management of these conflicts remains ineffective. Empirical evidence from a review of literature has unveiled conflicts to have a detrimental impact on construction projects' performance level, posing a significant barrier to project implementation success, frequently resulting in an increase in project costs, delays in completion, or, in the worst-case scenario, suspension of the project. This study used the measure of the existence or absence of conflicts in under-construction building projects to define the Project harmony aptitude level. This study sought to evaluate into the factors influencing Project Harmony Potential in Construction Projects in Kenya, using a cross-sectional research approach. The cluster technique was used to sample 128 construction building projects registered with NCA in Nairobi within a five-year timespan, which had the embedded unit of analysis under this study. Project developers and financiers, and consultants operating in consultancy or construction firms were randomly sampled and administered with questionnaires. The study utilized inferential statistical analysis of Pearson's bivariate correlation and regression analysis to identify the significant factors influencing project harmony. The analysis revealed a positive and statistically significant linear relationship between project harmony potential and delay management, partnering orientation of the project team, promptness of Monitoring and Evaluation, direct conflict management provisions in the Project Handbook (PMBOK), the technical experience of the Construction Project Manager (CPM), and communication plan. These parameters were deemed crucial in determining the project harmony potential for Kenyan building projects. These indicators were used to develop a model, which contributed to 69.2% of the project harmony potential. The established model may be used to estimate a project's potential for harmony throughout its execution.

INTRODUCTION

The construction industry is one of the most significant drivers of global economic development. In Kenya, the industry through its potential to create jobs is a critical pillar in the attainment of the country's Vision 2030. According to Kingsley (2015), the intricate and time-consuming process of designing and executing projects is marked by constant confrontations. This is affirmed in Leong *et al.* (2014) who assert that conflict in construction projects becomes an everyday occurrence due to the comprehensive and complicated structure of construction projects, as well as the engagement of many players interrelating to create an organization. According to a review of the literature, each construction project entails the involvement of a diverse group of specialists interact amongst themselves as individuals and, as a unit inside the project team or as a sub-group of the project team to an entity outside the project team, and whose duties and degree of engagement throughout project execution are determined by the procurement method used. The existence of the construction sector is attributed to the developer and contractor co-existing (Chigangacha & Haupt, 2018). Femi (2014) terms this complicated interrelationship as a temporary project coalition that matches conflict management performance to the expectations and goals of the parties.

Conflict, as several scholars including Vaux and Kirk (2018) and Agwu (2013) uphold, is an inescapable consequence of organizational operations. This, according to Agwu (2013), is because, despite the project team's diverse skills and experiences in divergent sectors, every project member individually has their unique aims and targets, opinions, and philosophies, which may differ from the organization's overall goals. When these conflicts are not promptly and constructively addressed at the appropriate level, the following effects occur; a sense of a challenge to one's interests by other parties, accusation game within the project team, and reduced management success (Mbatha *et al.,* 2021).

Conflicts, according to Mbatha *et al.* (2021), are among the constituents that sabotage project success since they may be time-consuming, costly, and distressing on the project participants' relationships, thereby bogging down and obstructing the seamless implementation of projects. This predominance of conflicts indicates the ineffective success of the current practice to the conflict management process, as construction industry actors have understatedly assimilated underpinning management expertise

that has a significant effect on relationships throughout project implementation.

If the conflict management system today were to incorporate in a more structured way all the potential conflict amongst all the project participants, projects would run more smoothly, thereby increasing the probability of project management success. Hughes *et al.* (2009) argue that the development of a good framework for conflict management that reduces the conflict ties between project participants will result in improved awareness of other team members, improved decision-making, stimulation of critical thinking, as well as improved quality and resource management, ensuring more time will be spent on advancing the project. If the project is to be successful, effective conflict planning and control necessitate an in-depth comprehension of their scope and nature, as well as identifying significant parameters that would aid in achieving a harmonious project by mitigating the effects of dysfunctional conflicts, developing mechanisms and strategies for their effective, promptly, and cost-effectively management practice.

LITERATURE REVIEW

Conflict Viewpoint

Conflict is defined by Ejohwomu *et al.* (2016) as the disagreement, dissonance, or mismatch of beliefs,

views, interests, perceptions, conceptions, conduct, or goals between and among persons. It is a phenomenon and a perception that another party's ambitions or aspirations are being impeded, whether factual or perceived, and the intensity of conflict is dictated by the degree to which a party is devoted to an objective (Mitkus & Mitkus, 2014).

The Spectrum of Conflict

Conflict has been viewed by Yale and Hardcastle (2003) as cited in Mbatha (2021), in the spectrum paradigm by correlating the keyword terms "claim," "dispute," and "conflict." The spectrum begins with defining claim as "a strong assertion or declaration of a legal right to money, property, or a legally enforced benefit, which can be founded under the contract itself; for breach of contract under common law, or on a quasi-contractual basis." Dispute is then defined as an unsettled claim. Yale and Hardcastle (2003) subsequently integrate these definitions for clams and disputes with sociological conceptions of conflict which state that conflicts occur when there is an incongruence of need and the mindset by one entity that this mismatch overlaps with the realization of their needs. These definitions are summarized diagrammatically using *Figure 1* below.

Figure 1: The spectrum of conflicts
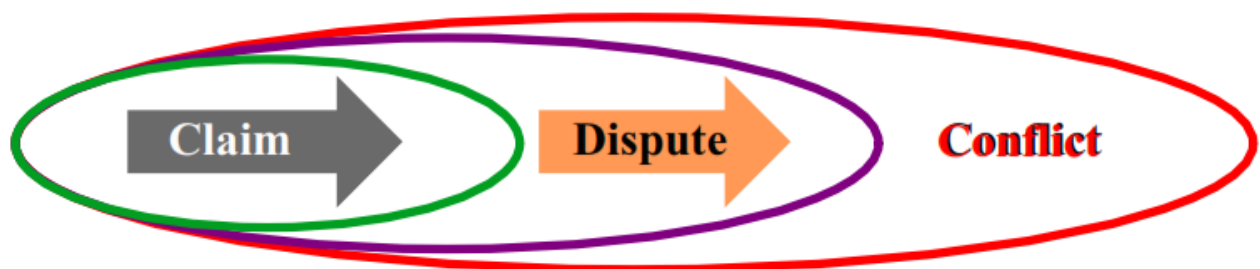
Source: (Mbatha, 2021)

According to the figure, conflict occurs synchronously from the time a claim note is issued on one end of the spectrum until the claim or dispute is addressed on the other end.

Taxonomy of Organizational Conflicts

The impact of conflict is a profoundly subjective assessment that takes into account each party's point of view. Organizational conflicts, whether semantic or subjective occur on three levels, according to Simmons & Peterson (2000) as demonstrated in *Figure 2* below. According to the figure, conflicts can occur horizontally across departments or vertically between levels of the organization or entity. Vaux (2014) classifies these three levels of conflicts into two broad categories, which he uses to validate the different impacts of conflict in construction, as well as how they frequently escalate, leading to mediation or litigation and loss of production as presented in *Figure 3* below.

Figure 2: Levels of conflict
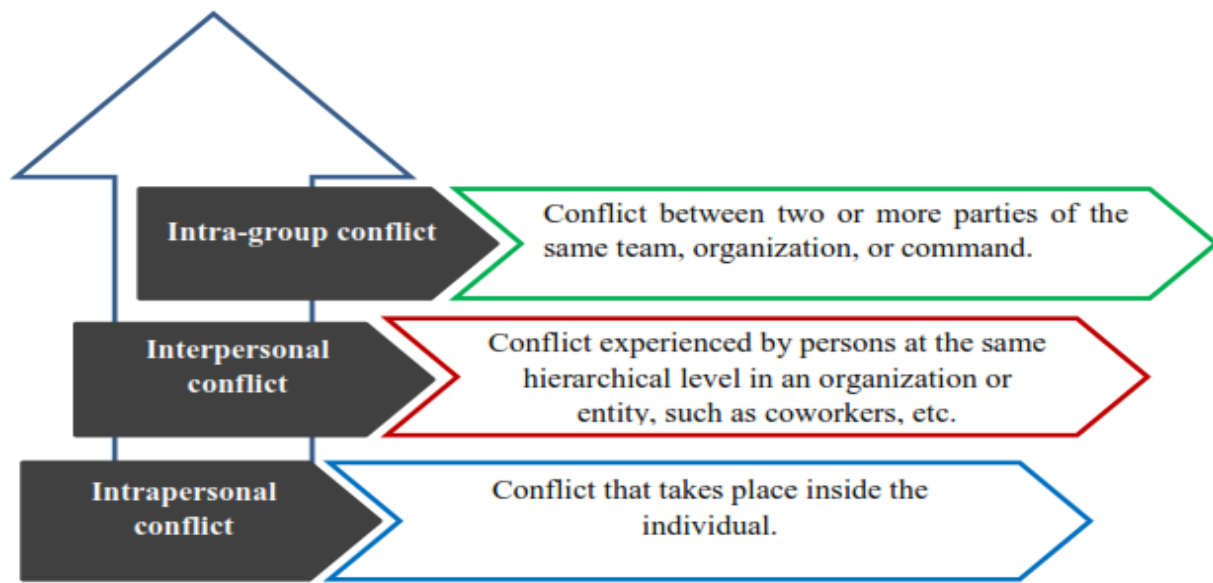
Source: (Simmons & Peterson, 2000)

Figure 3: Focus of conflicts
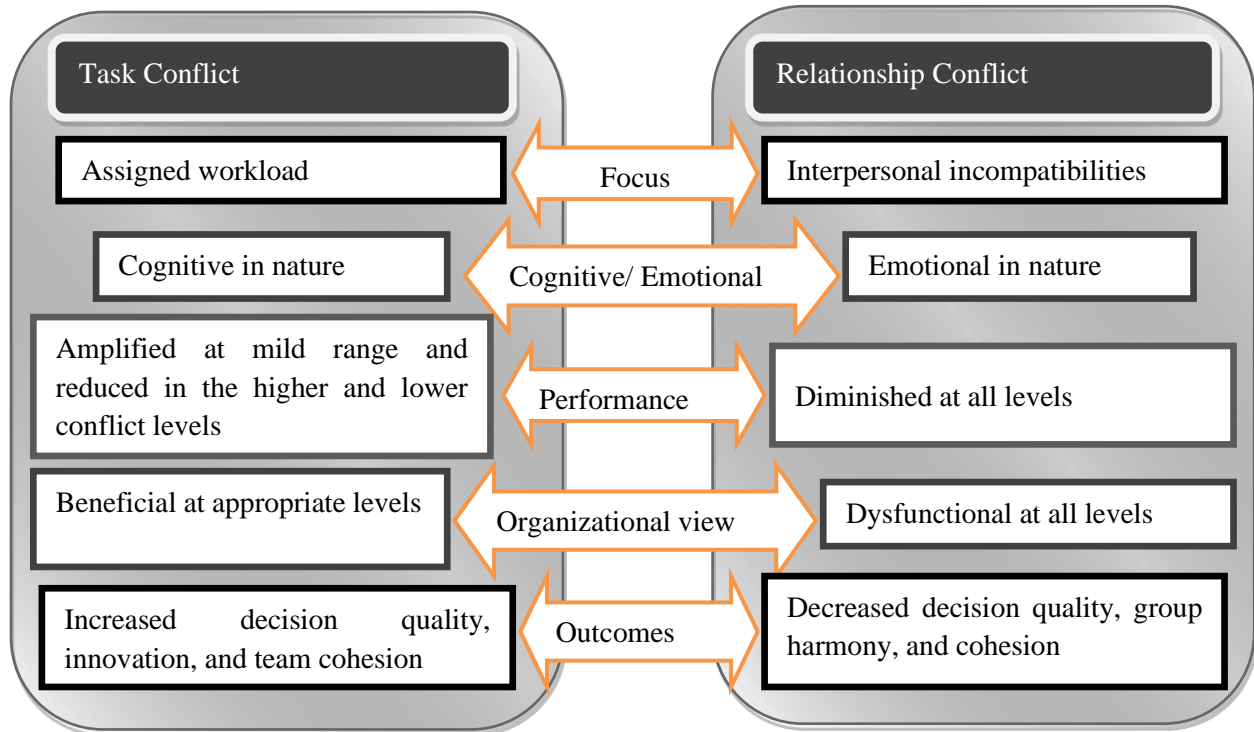
Source: (Adapted from Vaux, 2014)

Relationship conflict, also referred to as emotional conflict, focuses on bilateral misunderstandings that have little connection with the assigned workload or duty, frequently involving emotional stress over demeanour, respect, personality, trust, among other things. Whilst, task conflict, also known as cognitive conflict, centres on specific duty inclined discrepancies.

Other classifications of organizational conflict are Intra-organizational conflict, whose resolution is achieved by the subjugation of conflict management, and inter-organizational conflict which arises when two or more organizations compete with one another. According to Mullins (2013) conflict can take several forms depending on the organizational structure. For example, if an organization adopts a matrix structure as its organizational design, normative conflict is built-in, since the system requires each manager to report to two superiors. He asserts this to be the primary source of organizational conflicts. Resources such as time, personnel, money, expertise, and equipment are constantly scarce leading to competition for the limited resources among persons or departments. These factors linked to conflicts at the organizational level by Mullins (2013) have been illustrated in *Figure 4* below.

Figure 4: Taxonomy of organizational conflicts

Source: (Mullins, 2013)

Inexorable Nature of Conflicts

Repulsive force practically occurs whenever humans interact, including but not limited to disagreements, petty jealousy, and personality clashes (Ntiyakunze, 2011). This is to imply that conflict is unavoidable whenever there is an organization or a social gathering. Project managers and other organizational members must therefore be trained to manage these frictions in an ever-developing industry, or the project will fail. Scholars such as Ntiyakunze (2011), Soni *et al.* (2017), and Mbatha (2021) all agree that;

- The construction assiduity has a greater prevalence of conflicts than any other sector.

- The prevalence of disagreements has lately increased and continues to increase.

- Disputes have negatively impacted the industry's success.

Harmony and Conflict Management

Harmony can be indisputably viewed as a state in which team members are tranquil and agree with one another, or where things appear to be right or fitting together. In their study on engineering harmony under multi-constraint objectives, Wang *et al.* (2020) describe harmony as the practice of identity in order between parts, subsystems, and the environment in each step of engineering execution, with key consideration on quality, time, cost, and risk.

Harmony in Construction Projects

Project harmony potential, as Puttapalli and Vuram (2012) uphold, is "the reciprocal interaction between the management team and support staff about the terms of employment at the workplace." It is a condition within which workers have a collaborative and steady work relationship, which contributes to higher performance (Wobodo, 2019). Mbatha (2021) utilized the metaphor of project harmony to refer to a condition in which there are no conflicts in the construction project owing to its

excellent conflict management systems, which eventually translates to a successfully completed project. He uses project performance success indicators asserted by various management researchers like Puttapalli & Vuram (2012), Wobodo (2019), and Okaka (2019) to measure the project harmony level. These scholars describe a project's performance level by the project cost and budget performance, employee participation, mutual trust, the significance of the project to the organization's strategy, and customer satisfaction. Newell (2008) held that during a well-managed project team, disagreements and discrepancies could be addressed without causing frustration.

Conflict Management Approaches

There is the prospect of enhancing the level of satisfaction throughout the organizational entity with every resolved conflict. However, if a conflict is not addressed, what seems like a satisfying conclusion may simply be a relapse to one of the previous degrees of conflict. The main objective of arriving at an agreement that brings harmony in the project undertaking by improving the relationship between the members of the organization lies in the debate over whether conflicts should be resolved, transformed, or managed (Stickley, 2002). This approach is designed to examine the best interests and aspirations of the parties, empowering them, and supporting genuine needs to resolve their incompatibility and differences through the understanding of their rights and interests in each other. In their study, Bogofanyo & Amakiri (2016) maintain that when you become engaged in a conflict, there are two major concerns individuals have to take into account:

- Achieving your personal goals - Individuals conflict because they possess goals that contradict. Each values their goals more than they value any other persons'.

- Keeping a good relationship with the other person – This is due to the possible future need of working together on different projects. The importance of the relationship however varies.

RESEARCH METHODS

A quantitative technique was applied in this study. The study aimed to better understand conflict management scenarios in Kenyan construction projects. Quantitative data on various variables were gathered at the same time span, therefore, as Mugenda & Mugenda (2008), Creswell (2009), and (Bryman, 2012) asserts, this study can be considered as a survey research design. Survey research is a cross-sectional technique in which data may be collected at a single point in time using a questionnaire or formal interview, and it tries to examine the difficulties, circumstances, and problems of social phenomena that exist in society (Bryman, 2012). To acquire data from the target demographic, the researcher employed both manual and electronic surveys.

The study's research site was Nairobi County. Respondents were chosen based on their professional aptness in the construction sector, keeping in view the scope of the projects executed. Respondents were drawn at random from 128 constructing firms, and 30 consultancies all registered as NCA 1 through NCA 5 within this geographical outlook. It was important to include the consultants in the survey to avoid bias in the evaluation process by obtaining an external perspective. These have been regarded as significant in the project implementation process since they are considered to have the blueprint for construction project harmony, implying that they have the potential to provide significantly relevant and diverse insight on conflict management strategies in Kenya's construction projects. The Association of Consulting Engineers of Kenya (ACEK) and the Nairobi-based Architectural Association of Kenya (AAK) provided the demographic data on consulting firms. The

collected data was analysed with the Statistical Package for Social Scientists (SPSS v.21).

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

Experience in the industry

The responders have a substantial amount of building sector experience. This demonstrates the extent to which respondents had been exposed to conflict management. 41.3% of the respondents had industry experience of 11-15 year, 38.8% had more than 15 years of experience, and Respondents with an experience of between 6-10 were 14.9% while those below 5 years were 5%.

Figure 5: Industry experience
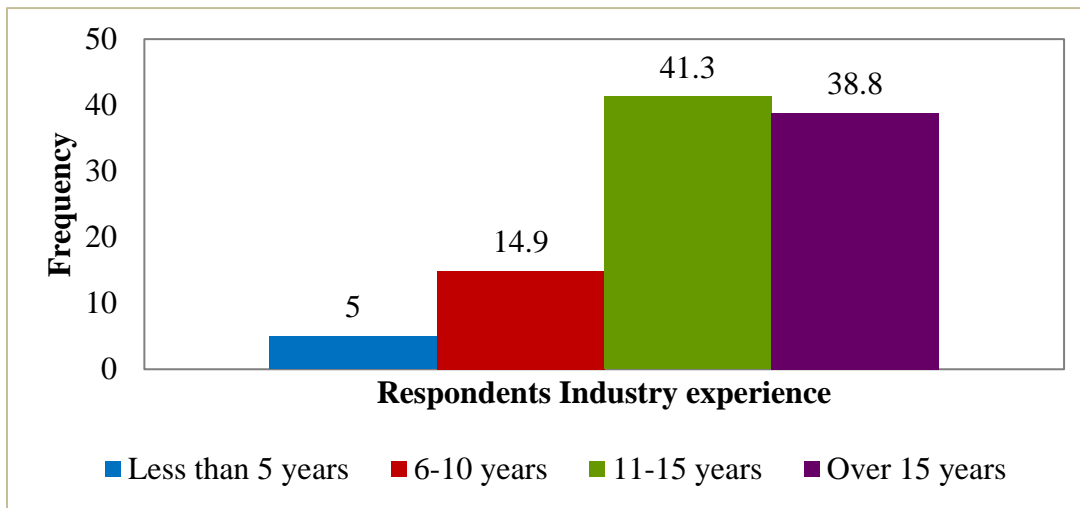
The mean experience for the respondents was 12.59 as demonstrated in *Table 1* below. This was beneficial to the research since the respondents were very accustomed to conflict management through projects previously executed.

Table 1: Mean experience for the respondents

Experience (years)	Mid value (X)	Frequency (F)	FX
Below 5	2.5	5	12.5
6-10	8	14.9	119.2
11-15	13.2	41.3	545.2
Over 15	15	38.8	582
Total		100	1258.9
Mean experience in Years $= \Sigma FX/\Sigma F = 12.59$ (1259/100)			

Category of Firm

Large-scale construction projects (above half a billion shillings) generally pique the interest of both local and foreign contractors as seen in *Figure 6*.

Figure 6: Category of Firm
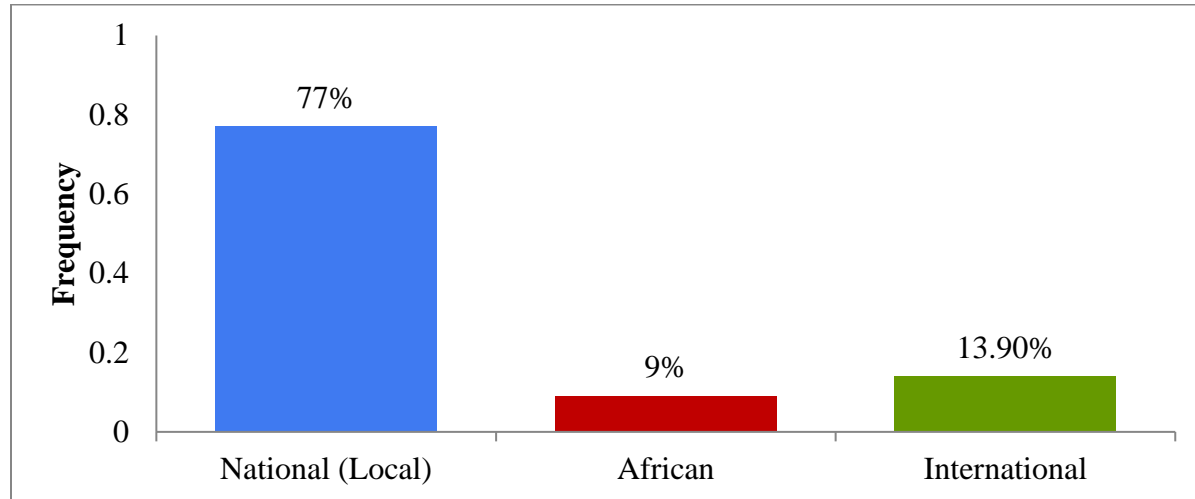
The predominance of local contractors implied an accurate reflection of viewpoints and stances of conflict management by the local firms.

Overall Performance of Harmony Potential

The project's harmony potential for all projects examined was a mean 3.86. This inferred that the overall projects' success level was on average. The projects were very successful in terms of safety, mutual trust, and cost performance, which are explained by mean values of 4.58, 4.31, and 4.29, respectively. The projects were perceived to be on average success in terms of stakeholder participation, quality, environmental impact, and user satisfaction, as shown by mean values of 4.20, 3.84, 4.15, and 3.21, respectively. Finally, the data on time performance show that the projects were unsuccessful, as shown by a mean value of 2.27. This implies that most of the projects had delays in execution.

Table 2: Overall performance of harmony potential

No.	Parameter	N	Min	Max	Mean	Std Dev.	Overall rank
P1	Time performance	106	1.0	4.0	2.27	0.750	8
P2	Cost performance	115	3.0	5.0	4.29	0.632	3
P3	Quality performance	117	1.0	5.0	3.84	0.731	6
P4	Stakeholder involvement	118	2.8	5.0	4.20	0.483	4
P5	Project environmental impact	120	1.0	5.0	4.15	0.984	5
P6	Operational Health and safety	121	2.0	5.0	4.58	0.616	1
P7	Mutual trust	120	3.0	5.0	4.31	0.719	2
P8	User satisfaction	121	2.0	5.0	3.21	0.921	7

The harmony potential performance level was obtained using the formula

$$PH = \left(\sum_{i=1}^{n} p\right)/n$$

Where 'n' is the number of dimensions of harmony potential performance and 'p' is the individual mean of the dimensions.

$$PH = \left(\frac{2.27+4.29+3.84+4.20+4.15+4.58+4.31+3.21}{8}\right)$$

$$PH = \left(\frac{30.850}{8}\right) = 3.86$$

Parameters of Project Harmony Potential

The descriptive for the parameters of project harmony potential indicated a significant degree of

success upon some attributes such as the utilization of the provisions for conflict management in the project handbook, and the responsiveness of monitoring and evaluation, with a mean of 4.17 and 4.44 respectively. Other parameters had a mean ranging from 2.61 to 3.99, inferring a necessity to optimize the conflict management practice for a more cohesive project.

Table 3: Parameters of Project Harmony Potential

Code	Parameter	N	Min	Max	Mean (μ)	Std. Dev.	Overall rank
CP1	Delay management	121	1.5	5.0	3.07	0.881	7
CP2	Project suitability by environment	118	2.0	5.0	3.44	0.724	6
CP3	Partnering orientation	121	1.5	5.0	3.72	0.903	4
CP4	Direct provisions for conflict management in the Project Handbook	120	3.0	5.0	4.17	0.640	2
CP5	Monitoring and Evaluation	122	3.5	5.0	4.44	0.488	1
CP6	Technical opinions	120	2.0	5.0	3.99	0.828	3
CP7	Technical experience of CPM	119	1.0	4.5	2.90	0.872	8
CP8	CPM expertise on psychology and criminology	122	1.0	4.5	2.61	0.883	10
CP9	Clear communication plan	114	3.0	4.5	3.68	0.494	5
CP10	Personality management	119	1.0	4.5	2.82	0.778	9
PH	Project harmony potential	97	3.18	4.48	3.86	0.275	

Correlation Analysis

The study performed Bivariate Pearson's correlation analysis to determine the amplitude, direction, and significance of the correlation between the dependent and independent variables. The correlation coefficients were used to statistically investigate the relationship between the variables. The correlation between promptness of Monitoring and Evaluation operations and Project harmony potential was the strongest and most significant, $r = 0.729$; p-value < 0.001), implying that a unit increase in the predictor variable will lead to an increase in both the predictor variable and the dependent variable. Other correlations between variables, that were positive and statistically significant are; direct provisions for conflict management in the Project Handbook (PMBOK) and Project harmony potential, $r = 0.694$; p-value < 0.001, technical aptitude experience of the CPM and Project harmony potential, $r = 0.502$; p-value < 0.001, clear communication plan and project harmony potential, $r = 0.339$; p-value= 0.001, partnering orientation of the project team and project harmony potential (Y), $r = 0.279$; P-value = 0.006.

Table 4: Pearson's correlation between the predictor variables and project harmony potential

		PH	CP3	CP4	CP5	CP7	CP9
PH	Pearson Correlation	1	0.279**	0.694**	0.729**	0.502**	0.339**
	Sig. (2-tailed)		0.006	0.000	0.000	0.000	0.001
CP3	Pearson Correlation		1	0.168	0.128	0.224**	0.020
	Sig. (2-tailed)			0.068	0.162	0.008	0.849
CP4	Pearson Correlation			1	0.608**	0.281**	0.306**
	Sig. (2-tailed)				0.000	0.002	0.001
CP5	Pearson Correlation				1	0.352**	0.325**
	Sig. (2-tailed)					0.000	0.000
CP7	Pearson Correlation					1	0.218**
	Sig. (2-tailed)						0.021
CP9	Pearson Correlation						1
	Sig. (2-tailed)						

** Correlation is significant at the 0.01 level (2-tailed)

PH=Project harmony potential; CP3= Partnering orientation of project team; CP4= Direct provisions for conflict management in Project Handbook; CP5=Promptness of Monitoring and Evaluation; CP7= Technical experience of CPM; CP9=Clear communication plan

Regression Model This study applied stepwise regression analysis to examine if independent variables predict the dependent variable. The results revealed that promptness of Monitoring and Evaluation had the highest effect on project harmony potential with a standardized coefficient of (0.457) followed by direct provisions of conflict management in the Project Handbook (0.257), Technical experience of CPM (0.180), Clear Communication plan (0.146), Partnering orientation of project team (0.135), and ultimately, Delay management (0.125). The constant term was found to be 1.408, therefore indicating that if all other variables remained constant, the project's harmony potential increased by 1.408 units.

Table 5: Linear regression analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F
		B	Std. Error	Beta				(P-value)
1	(Constant)	2.016	.191		10.528	.000	.518	91.248
	ME	.412	.043	.724	9.552	.000		(0.001)
2	(Constant)	1.953	.175		11.132	.000	.598	63.554
	ME	.271	.052	.476	5.231	.000		
	PHB	.164	.039	.382	4.196	.000		
3	(Constant)	1.807	.169		10.709	.000	.649	52.849
	ME	.250	.049	.438	5.117	.000		(0.001)
	PHB	.142	.037	.332	3.851	.000		
	TE	.081	.023	.246	3.597	.001		
4	(Constant)	1.692	.174		9.732	.000	.664	42.524
	ME	.276	.049	.485	5.600	.000		(0.001)
	PHB	.116	.038	.270	3.033	.003		
	TE	.073	.022	.221	3.253	.002		
	DMT	.048	.022	.146	2.137	.036		
5	(Constant)	1.503	.193		7.780	.000	.677	36.263
	ME	.261	.049	.458	5.333	.000		(0.001)
	PHB	.112	.038	.260	2.972	.004		

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2	F
		B	Std. Error	Beta				(P-value)
	TE	.071	.022	.215	3.231	.002		
	DMT	.045	.022	.139	2.067	.042		
	CCP	.078	.038	.134	2.066	.042		
6	(Constant)	1.408	.194		7.240	.000	.692	32.290
	ME	.260	.048	.457	5.434	.000		(0.001)
	PHB	.110	.037	.257	3.004	.004		
	TE	.060	.022	.180	2.683	.009		
	DMT	.041	.022	.125	1.885	.063		
	CCP	.085	.037	.146	2.291	.025		
	PPO	.038	.018	.135	2.114	.038		

a. Dependent Variable: Project Harmony potential

An optimized model was developed by using the significant factors only, the coefficient of determination (R2) being 0.692. This indicated that the moderating variables have a 69.2% effect on project harmony potential. The regression model was proven to be accurate in forecasting a project's project harmony potential, F=32.290; p=<0.001, resulting in the regression equation;

$$PH = 1.408 + 0.041CP_1 + 0.038CP_3 + 0.110CP_4 + 0.260CP_5 + 0.060CP_6 + 0.085CP_9$$

CONCLUSIONS

The average measures harmony potential of projects implied conflicts prevalence in construction projects, thus the need of recognizing and assigning risk areas lest they develop into conflicts.

The study concludes and recommends the following;

- To ensure a high level of project harmony potential for construction projects in Kenya, a greater emphasis should be placed on monitoring and evaluation, diagnosing the nature and character of any emerging conflict to establish an integrative approach and determine the most effective solution, as outlined in the PMBOK 5th edition.

- An extensive and thorough diagnosis should be carried out in the organization, to include an evaluation of the degree of conflict at the interpersonal, intragroup, and intergroup levels, the source of that conflict, as well as an assessment of the relationships between them. The data should assist project managers to identify any conflict issues and determine the optimal intervention plan for the conflicts.

- Technical incompetence was identified as a major impediment to conflict conceptualization and thus conflict management. This analysis validated Morris et al. (1998) findings that the project manager has the obligation for reviewing and understanding the dynamics of conflict and managing it. Consequently, the primary focus when selecting the appropriate project team should be on the academic credentials, training and certification, and experience in conflict and dispute resolution, as well as the competence in BIM and project management tools.

- Project team members should be accorded enough room to apply their experiences and expertise gained from previously executed projects, as well as a clear and extensive communication strategy developed for observation throughout the entire project implementation process.

- A review of the organizational existing policies, norms or behaviour was ranked as one of the best

approaches for optimizing the project harmony potential level. According to (Simon, 2021), such transformative leadership in an organizational culture demands significant support from top-level management. In this view, the support of top-level management in conflict management within the project organization was considered very imperative.

- The synthesized model developed is to be tested in conflict management for building projects. It is anticipated that the model framework will enhance harmony potential level for construction projects in Kenya. However, the model integrated a portion of the factors hypothesized in the review of literature to affect harmony potential in projects. The research found these factors to contribute to 69.2% of the project harmony potential level, thus the need for further research to define and establish the other parameters accounting for the remaining 30.8%.

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