# Relationship Quality and Time Performance of Construction Projects: The Mediating Role of Joint Working Practice

**Shuaib M. R[a*], Hanafi M. H[b], Shaian Kiumarsi[c],** [a,b,c]School of Housing Building and Planning, University of Sains Malaysia. Pulau of Penang. Graduate School of Business, Universiti Sains Malaysia, 11800 USM, Email: [a*]rshuaib73@gmail.com

We hypothesised that joint working practice, defined as a set of practices among project partners that involved combined efforts of the parties in managing the project task mediate the relationships between the four attributes of relationship quality (trust, teamwork, commitment and performance satisfaction) in improving time performance of construction projects. Using purposive non-probability sampling technique, 245 quantitative sample data was collected and analysed. The study focused on key informants such as directors and managers within the several organisations involved in capital projects development in Nigeria. The data was analysed and hypothesises were tested using partial least squares structural equation modelling. The results suggest a direct influence of trust, teamwork and performance satisfaction on joint working practice as well as significant influence of joint working practice on time performance. The study further confirms the indirect influence of trust among project parties; teamwork capability and performance satisfaction on time performance and additionally summits that without joint working practice, project teams often face difficulty in achieving time certainty. On the other hand, a party's commitment to project objectives did not influence joint working practice among project partners neither indirectly (through joint working practice) significant to time performance. The study finally showed that three (3) of the attributes of RQ (trust, teamwork and PS) explained 21% variation in the project time performance while the remaining 79% is explained by the variables or other aspects outside the model. This indicates the importance of these variables on construction performance in Nigeria.

**Key words:** *Capital project, Joint working practice, Relationship quality, Time performance.*

## Introduction

The construction industry is often faced with problems associated with poor projects' performance, covering on-time delivery, cost overruns, quality issues, disputes and/or safety related matters. For a long time, these have been major areas of concern to many researchers and practitioners within the industry (Meng, 2012). This study therefore looked at time overruns as a key indicator of poor project's performance. According to Ngacho & Das (2014) project timely completion could be influenced by timely delivery of resources, harmonious relationship of the parties, clarity of formulated plan, delays in securing funds, effect of weather and climate conditions, design changes and manifestations of apparent defects at handover. Similarly, changes in project design, influence of productivity of labor, poor planning, and inadequate resources are other factors associated with time overruns (Assaf & Hajji 2006; Kaming, Olomolaiye, Holt, & Harris, 2010).

Few studies have considered issues relating to supply chain (SC) relationships as some of the reasons for poor time performance of construction projects. For example, the nature of contractual relationship between the parties is seen as an issue associated with poor time performance (Odeh & Battaineh, 2002). On the other hand, management strategy of the relationships among the parties has been reported to affects timely completion (Meng, 2012). In another study, deterioration of relationships quality (RQ) is associated with unnecessary conflicts, indecisiveness, and inadequate coordination (Zheng; Lu, ASCE; Le; Li; and Fang 2018). Furthermore, poor relationship quality has been studied to negative affects on both time, cost and quality of construction projects (Handfield, Primo, & Oliveira, 2015; Meng 2012; Meng & Boyd, 2017).

Skarmeas & Robson (2008) in manufacturing defines relationship quality as a concept which described level collaboration resulting from trust, commitment and satisfaction among the supply chain partners. This corroborate several studies on RQ which identified and emphasised these constructs as attributes for RQ in construction (Dorsch, Swanson, & Kelley, 1998; Lu & Guo, 2019). RQ in construction has been conceptualised as the grade of suitability of a relationship among supply chain partners in a project (Zheng et al. 2018; Jelodar, Yiu, & Wilkinson, 2016). A review of the extant literature exposes the lack of an integrated model produced through an empirically validated research on how the attributes of relationship quality relate to each other and promote timely delivery of construction projects. Additionally, the indirect effect of RQ on TP through a mediator (joint working practice) is also yet to be studied. This study therefore attempts to respond to issues concerning how joint working practice (JWP) mediate the relationship between SCRQ and TP of construction projects.

**Literature Review**

*Supply Chain Relationship Quality*

Early studies defined RQ as "high order construct" (Crosby, Evans, and Cowles 1990 cited in Özge et al. 2019; Jelodar et al., 2016) that could be described by several layers of attributes (Hair, 2010) which represents an evaluation mechanism that explained the status of a working relationships among SC partners (Ashnai et al., 2009; Jelodar et al., 2015). According to Özge et al. (2019), Crosby et al. (1990) were among the first researchers who found the supportive empirical evidence on how relationships management (RM) is measured by the status of RQ among the SC partners. RQ is measured based on the strength and depth of the overall relationship among the SC partners (Bove & Johnson, 2001 cited in Lu & Guo 2019).

The emergence of many definitions and conceptualisations of RQ had given rise to several issues relating to what should constitute the dimensions of measuring the strength and depth of relationships among SC partners in construction (Jelodar et al., 2016). For instance, while Lu & Guo (2019) considered the concepts such as satisfaction, trust and commitment as dimensions for RQ in construction, authors such as Özge et al. (2019) and Zheng et al. (2018) measured RQ using few related dimensions without recognising any conceptualised attributes. In a study on de-contextualization and re-contextualization of literature on relationships management (RM), four major attributes of relationships quality have been identified as trust, commitment, teamwork and performance satisfaction. These hold the most valued relationship quality factors in construction (Dorsch et al. 1998 cited in Lu & Guo, 2019; Huang, Luo, Liu, & Yang, 2016; Jelodar et al. 2016; Jelodar et al. 2015). Hence they were adopted for this study.

*Trust*

Trust is the willingness of contractual parties to be vulnerable to actions of each other based on positive expectations regarding their motivations and behaviours (Lu & Guo, 2019). Trust is an essential relational attribute (Jelodar et al., 2016) as it achieves flexibility and ensures reliable information flows throughout supply chain in construction (Manu, Ankrah, Chinyio, & Proverbs, 2015). According to Meng (2010) absence of trust creates opportunistic behaviour and subject the supply chain relationships to jeopardy. Therefore, trust is regarded as one of the measurement dimension of inter-personal and inter-organizational relationships quality and by extension, a key attribute to performance (Suprapto, Bakker, & Mooi, 2015). This therefore corroborate the findings of Meng (2012) who submits that there are significant positive relationships between trust and parameters of project performance such as cost and time. In this regard, this study hypothesized:

**H1**: A positive influence of trust on time performance of construction project.

*Teamwork*

Synergistic relationships of project parties have been established to have a significant influence on project performance (Kumaraswamy & Rahman, 2006; Suprapto et al., 2015). In the context of project management, this relationship which has been described as team work, reflects the actual interactive activities between project supply chain members (Baiden & Price, 2011; Suprapto et al., 2015). Teamwork through collaboration and communication is an essential attribute of RQ (Jelodar et al., 2016; Jelodar et al., 2015) and it has been operationalised in construction as team communication, collaboration, and cohesiveness (Yang, Shen, Ho, Drew, & Xue, 2011). This confirmed the opinion of Meng (2012) who suggested a significant positive link between collaborative joint working, communication openness and time performance. Taking these into account, this research therefore hypothesized:

**H2**: A positive impact of teamwork on time performance.

*Commitment*

Commitment is the personal or organisational attitude that defined the willingness of a supply chain party to invest effort in building and maintaining their relationships with other parties (Lu & Guo, 2019). According to Jelodar et al., (2016) it is an important attribute for RQ applicable to all industry groups. Commitment of supply chain partners in construction could be achieved through strategies such as; mutually accepted goals; clarity of responsibility; collaborative procurement system; risk/reward sharing strategies and change in policy to create harmonious organizational cultures (Meng 2010; Yeung, Chan, & Chan, 2012). Meng (2012) found a significant association between risk allocation, collaborative procurement strategy and time performance in construction. Following the reviewed literature, this study hypothesized:

**H3**: A positive influence of commitment on time performance.

*Performance Satisfaction*

In the context of construction projects, satisfaction has two dimensions of assessment. To the client, it refers to overall evaluation of the entire project delivered by the contractors in accordance with the contract. On the other hand, it is used to express the contractor's overall assessment of the client's ability to deliver the contractual obligations under the contract. In addition to the influence of many other factors, performance satisfaction in construction has been linked to cost, time and quality, which according to Drexler et al., 2000 cited in Suprapto et al., (2015) is also associated with issues relating to work performance, attitude of

the contractual parties, their personal integrity, behavioural traits and honesty. This bring us to the fourth hypothesis of the study:

**H4:** Performance satisfaction impact positively on time delivery of a project.

### *Joint Working Practice (JWP)*

The conceptualisation of the term "joint working" practice (JWP) was adopted from Suprapto et al., (2015) as set of practices among project partners that involved combined efforts of the parties in managing project task. It generally reflects; joint decision making (Meng, 2012; Chan, Scott, & Chan, (2004) joint approach for disputes handling, resolution and for continuous improvement (Meng, 2012) and joint risk management (Suprapto et al., 2015). In an empirical study by Meng (2012), "Time certainty" has been reported to be significantly associated with "joint working and team collaboration." Therefore, to achieve significant time performance in project delivery, the practice of joint working is highly required. Following this finding, we hypothesized that:

**H5:** Joint working practice impact positively on time performance.

### *Mediating Role of Joint Working Practice*

Joint working practice is the mediator considered in this study. The influence of JWP on timely performance of a construction project has been previously established. Consequently, this research provides a grounding confirmation for the mediating effects of JWP on a relationship between SCRQ and TP in construction. Linking the effect of SCRQ to time performance, we hypothesized that:

**H6**: Joint working practice has a positive mediating role between trust and time performance.
**H7**: Joint working practice has a positive mediating role between teamwork and time performance.
**H8**: Joint working practice has a positive mediating role between commitment and time performance.
**H9**: Joint working practice has a positive mediating role between performance satisfaction and time performance.

### **Underlying Theory**

According to Bromley & Rau (2014), performance-based view (PBV) theory is an alternative to resources-based view (RBV) theory in strategic management research. While PBV theory emphasises on the actual techniques of thr firm's practices to achieve organisational

performance, the resources-based view (RBV) theory on the other hand attempts to explain performance based on things that are imitable and transferable practices. According to Barney (1991) *"resource-based theory posits that an organidation can achieve sustainable competitive advantage by controlling resources that are valuable, rare, imperfectly imitable"*, and non-substitutable. An important premise of RBV is that every firm's resources are heterogeneous which also significantly and uniquely differs across each firm (Özge et al. 2019; Wittmann, Hunt, & Arnett, 2009). This, in addition to the way these resources are manage explained the difference levels of performance of the firms (Combs & Ketchen, 1999; Özge et al. 2019). Considering the competitive advantage of SCR in project delivery (Wang & Sengupta, 2016) we argue that RBV would explain SCRQ as a valuable resources of construction projects, which certainly will lead to time performance as the key outcome variable in this study.

**Conceptual Framework**

This study finally presents a conceptual framework that explained how SCRQ affects JWP among construction project team and whether the implementation of better JWP as a mediator lead to better TP.

**Figure 1.** Conceptual Research framework
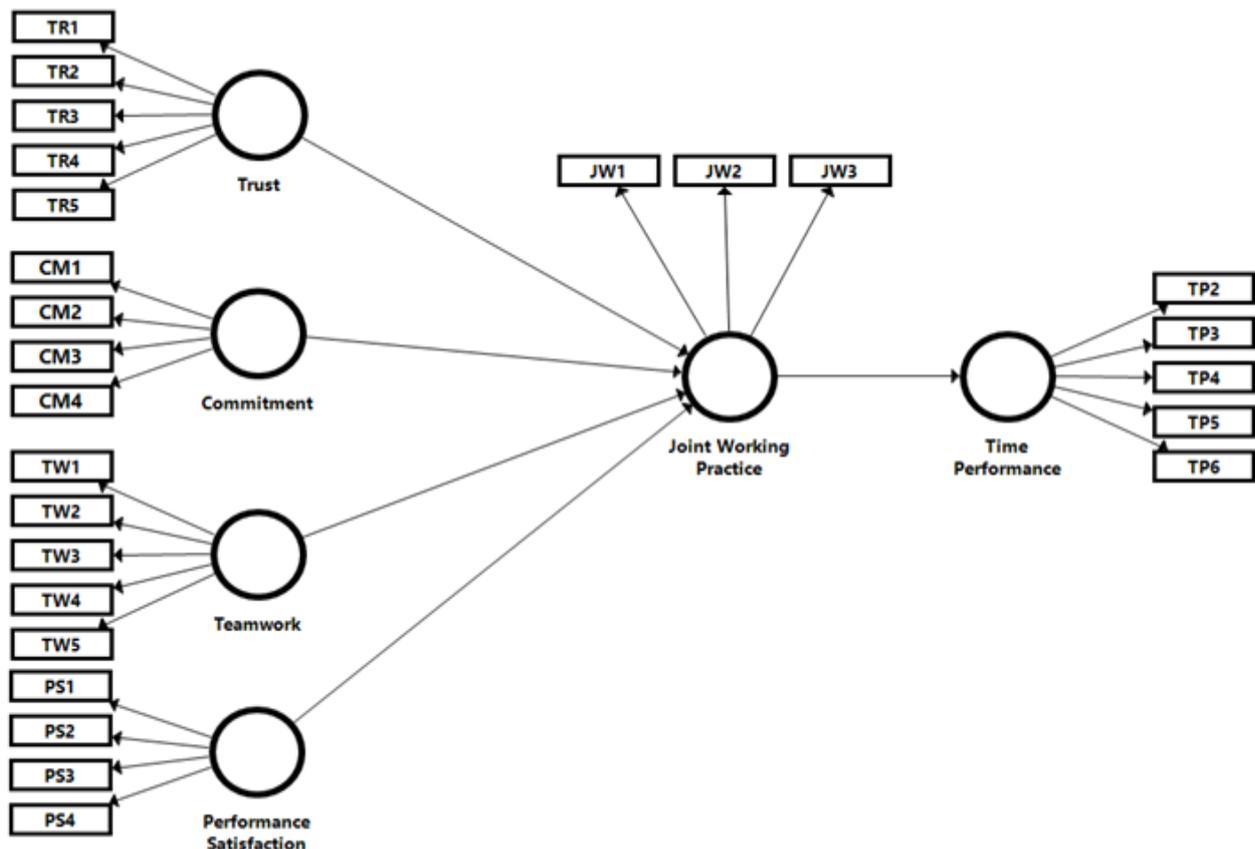
**Research Method**

The research method involved a survey conducted following review of relevant literature on the research subject. The study model and hypothesis were tested following the tests for reliability and validity of the measurement instruments. The resultant version of the instrument was finally used for data collection.

*Construct Measures*

To measure the identified independents variables for the study, the survey considered a total of nineteen (19) items relating to four (4) constructs for SCRQ (trust; commitment, teamwork and performance satisfaction); four (4) items to measure the mediating variable (JWP) and seven (7) items to measure the dependent variable (TP).

*Measurements*

The measurements considered in this study were developed from literature on relationship management and performance development framework in construction. However, both the constructs and measurement items were adapted from several studies including Jelodar, Yiu, and Wilkinson 2016; Lu & Guo, 2019; Meng, 2012; Ngacho & Das, 2014; Suprapto et al., 2015; etc. These are existing scales from extent literatures proven and validated as reliable. The constructs were therefore measured following adaptation of this modified scales using 5-linkert scale.

*Sampling and Data Collection*

This research was conducted within Nigeria. The data was collected from key informants' professionals within the construction industry in Nigeria. These comprises of principals, directors and managers of consulting organisations, contractors, suppliers and client's organizations in Nigeria. Key informants were selected because of their outstanding knowledge and experience in exchange relationships (Lu & Guo, 2019; Shiu, Jiang, & Zaefarian, 2014; Zheng et al. 2018). The questionnaire from previous studies was adapted for this study. The research targeted responses from 20 selected multifarious infrastructure projects in Nigeria. The total population size is unknown, therefore a non-probability approach using purposive method was used (Chan, Yun, Hu, & Shan, 2015).

The exercise took place from June 2019-December 2019. Prior to that, the questionnaire was first scrutinized for practicability by veteran industry practitioners and university scholars in Kano and Abuja. Of the 450 questionnaires distributed, 256 (56.9%) responses were received out of which 11 (4.3%) were noticed to have missing or unmatched values, thereby leaving

an effective response of 245 (54.4%). In the opinion of Williams, Gavin, & Hartman (2004) this represent an adequate and acceptable response for the study.

**Data Analysis and Results**

In testing the research hypothesis, PLS structural equation modelling (using Smart PLS 3.2.8 software) was used to evaluate the measurement scales in this study. It is a strategy applied to model several relationships among multiple latent variables (Hair et al. 2014; Leguina, 2015) and mostly for a relatively small number of samples and for an exploratory study  (Le et al,. 2014). The study considered a three-step analysis in testing the research hypotheses. First, reliability and validity test of the constructs, analysis of the structural model and examination of the mediating effects of joint working practice on the relationship between SCRQ and time performance.

*Measurement Model*

As shown in Table 2, the measurement model was validated in three different ways; assessment of its validity, indicator reliability and internal consistency. The test for validity comprises of discriminant and convergent validity. The composite reliability (CR) was estimated to be greater than 0.7 thus indicating a satisfactory internal consistency (Hair et al., 2014). The loadings of the various measurement items on their corresponding constructs were examined to be greater than 0.4 hence signifying a satisfactory indicator reliability (Hair et al., 2011; Le et al. 2014). The values of the average variance extracted (AVE) for all the constructs were also examined to measure their convergent validity, here, all the AVE values were greater than the minimum threshold value of 0.5, thus indicating a satisfactory convergent validity (Cao, Li, & Wang, 2014).

**Table 2:** Measurement model of PLS (n=245)

| Latent variable | Items | Loading | AVE | CR | CA |
|---|---|---|---|---|---|
| Commitment | CM1 | 0.775 | 0.600 | 0.856 | 0.807 |
| | CM2 | 0.668 | | | |
| | CM3 | 0.866 | | | |
| | CM4 | 0.777 | | | |
| Joint Working Practice | JW1 | 0.810 | 0.672 | 0.860 | 0.755 |
| | JW2 | 0.847 | | | |
| | JW3 | 0.801 | | | |
| Performance Satisfaction | PS1 | 0.686 | 0.632 | 0.872 | 0.809 |
| | PS2 | 0.896 | | | |
| | PS3 | 0.768 | | | |
| | PS4 | 0.815 | | | |
| Time Performance | TP2 | 0.877 | 0.540 | 0.852 | 0.799 |
| | TP3 | 0.702 | | | |
| | TP4 | 0.680 | | | |
| | TP5 | 0.562 | | | |
| | TP6 | 0.814 | | | |
| Trust | TR1 | 0.694 | 0.504 | 0.835 | 0.787 |
| | TR2 | 0.641 | | | |
| | TR3 | 0.678 | | | |
| | TR4 | 0.721 | | | |
| | TR5 | 0.804 | | | |
| Teamwork | TW1 | 0.785 | 0.634 | 0.896 | 0.877 |
| | TW2 | 0.836 | | | |
| | TW3 | 0.771 | | | |
| | TW4 | 0.846 | | | |
| | TW5 | 0.738 | | | |

Note that the main loadings of TP1, CM5 and JW4 are all less than 0.5 hence deleted.

***Discriminant validity of Hetero trait-Monotrait Ratio (HTMT)***

The study further confirmed the satisfaction of the measurement discriminant validity by examining the values of hetero-trait and mono-trait ratio (HTMT) as a criterion (Henseler, Ringle, & Sarstedt, 2015). As shown in table 3 below, the observed value of the HTMT for all the constructs is below the threshold value of 0.85. This, according to Kline (2011), established a satisfactory discriminant validity of the measurement model.

**Table 3:** Discriminant validity of Hetero trait-Monotrait Ratio (HTMT) (n=245)

| Construct | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| **1.** Commitment | | | | | | |
| 2. Joint Working Practice | 0.146 | | | | | |
| 3. Performance Satisfaction | 0.073 | 0.576 | | | | |
| 4. Teamwork | 0.082 | 0.256 | 0.306 | | | |
| 5. Time Performance | 0.092 | 0.528 | 0.814 | 0.274 | | |
| 6. Trust | 0.166 | 0.340 | 0.255 | 0.352 | 0.363 | |

*Structural Model*

Two steps were involved in analysing the structural model to test the research hypothesis. In the first step, PLS 3.2.8 was used to run a non-parametric bootstrapping procedure to examine the significance of the path coefficients between all the constructs (Hair et al., 2014) (Hypothesis 1 to H9).

*The Direct Effects of Relationship Quality*

The results given in Fig. 2 and Table 4 indicate that commitment of the supply chain partners does not directly affects time performance (t-value = 1.382, p = 0.083). Thus, hypotheses H3 is not supported. In contrast, we found that trust (t-value =2.761, p = 0.003), teamwork (t-value = 2.644, p = 0.004) and performance satisfaction (t-value = 1.382, p = 0.083) all have positive effects on time performance. In other word, H1, H2 and H3 are fully supported. Controlling the effects of the four attributes of RQ (trust, teamwork, commitment and performance satisfaction), joint working practice significantly increases time performance (t-value=10.718, and p= 0.000). This indicate that hypothesis H5 is significantly supported. Table 4 below presents the path coefficients of the direct effect of the study. Furthermore, the study examined the multicollinearity among the indicators of the variables to identify potential redundancy. According to Hair, Hult, & Sarstedt (2013), a recommended value of variance inflation factor (VIF) less than five (5) indicates a non-critical level of multicollinearity. In this study (table 4), the average VIF value of all indicators ranged from 1.003 to 1.173 hence indicating a non-multicollinearity issue.

**Table 4:** Significance of direct effects- Path coefficients (n=245)

| Path | Beta value | SE | t-value | p-values | Result | $f^2$ | VIF |
|---|---|---|---|---|---|---|---|
| CM →JW | 0.126 | 0.091 | 1.382 | 0.083 | Not Supported | 0.023/S-E | 1.003 |
| JW → TP | 0.468 | 0.044 | 10.718*** | 0.000 | **Supported** | 0.281/M-E | 1.000 |
| PS →JW | 0.465 | 0.046 | 10.174*** | 0.000 | **Supported** | 0.297/M-E | 1.071 |
| TW → JW | 0.188 | 0.071 | 2.644* | 0.004 | **Supported** | 0.046/S-E | 1.139 |
| TR →JW | 0.155 | 0.056 | 2.761* | 0.003 | **Supported** | 0.030/S-E | 1.173 |

**Note:** *$p<0.05$, $t>1.645$, **$p<0.01$, $t>2.327$, ***$p<0.001$, $t>3.092$ (one tailed); SE: Standard Error; M-E: Medium effect; S-E: Small effect

**Figure 2.** PLS-Path analysis of t-values (n=245)
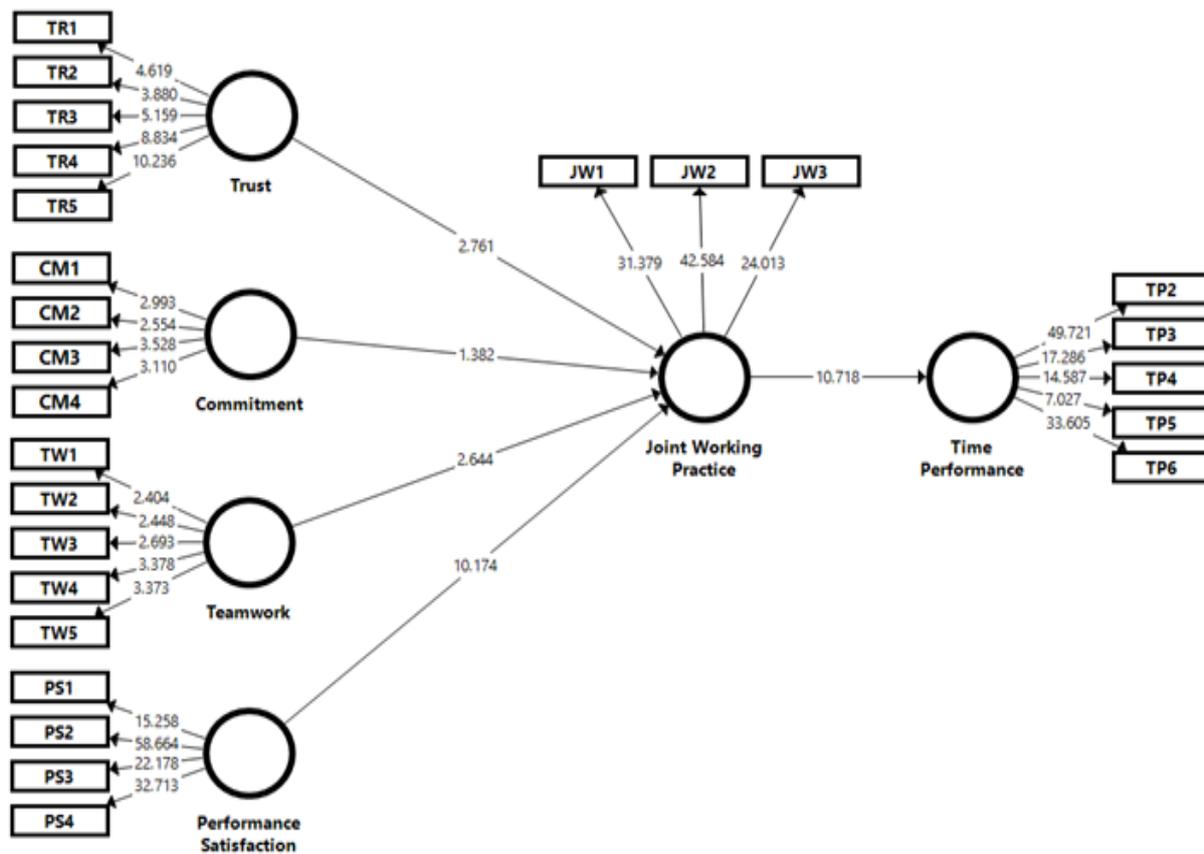
## Mediation of Joint Working Practice

In testing the indirect effect of the four attributes of RQ on time performance through the mediator (joint working practice), a bootstrapping non-parametric re-sampling procedure was used. In the second step, we performed statistical analysis to assess the indirect (mediation) effects of the four attributes of RQ on time performance through (the mediator) joint working practice (hypotheses H6, H7, H8 and H9). Using bias-corrected bootstrapping of 5000 sub-samples, the two-tailed test results evidently indicates that joint working practice significantly mediates the positive effects of performance satisfaction (t-value = 6.222**, p = 0.000), teamwork (t-value = 2.576*, p = 0.010) and trust (t-value = 2.527*, p = 0.012) on time performance. Additionally, the results did not support a mediation role of joint working practice on a relationship between commitment and time performance (t-value =1.328, p = 0.184). This implies that H8 is not supported but H6, H7 and H9 are empirically substantiated. Table 5 shows the significance of specific indirect effects - Path coefficients.

**Table 5:** Significance of specific indirect effects- Path coefficients (n=245)

| Path | Beta value | SE | t-value | p-values | Result |
|------|-----------|-----|---------|----------|--------|
| CM→JW→TP | 0.059 | 0.044 | 1.328 | 0.184 | Not Supported |
| PS→JW→TP | 0.218 | 0.035 | 6.222** | 0.000 | **Supported** |
| TW→JW→TP | 0.088 | 0.034 | 2.576* | 0.010 | **Supported** |
| TR→JW→TP | 0.072 | 0.029 | 2.527* | 0.012 | **Supported** |

**Note:** *p<0.05, t>1.96, **p<0.01, t>2.58 (Two tailed); SE: Standard Error

## Predictive Relevance ($Q^2$)

The coefficients of determination (R2 values) was also observed to explain the variation in the endogenous constructs hence, substantiating the predictive validity of structural model (Hair et al., 2013). As shown in fig. 4 and table 6, there is 32% of the variance in joint working practice and 21.9% in time performance. Furthermore, a blindfolding procedure was applied to assess the Q2 value (Akter, Ambra, & Ray, 2011). These were observed for both joint working practice and time performance to be 0.199 and 0.099 respectively. These results suggest that the model does have predictive relevance having a Q2 value greater than zero (Akter et al., 2011; Chin, 2010).

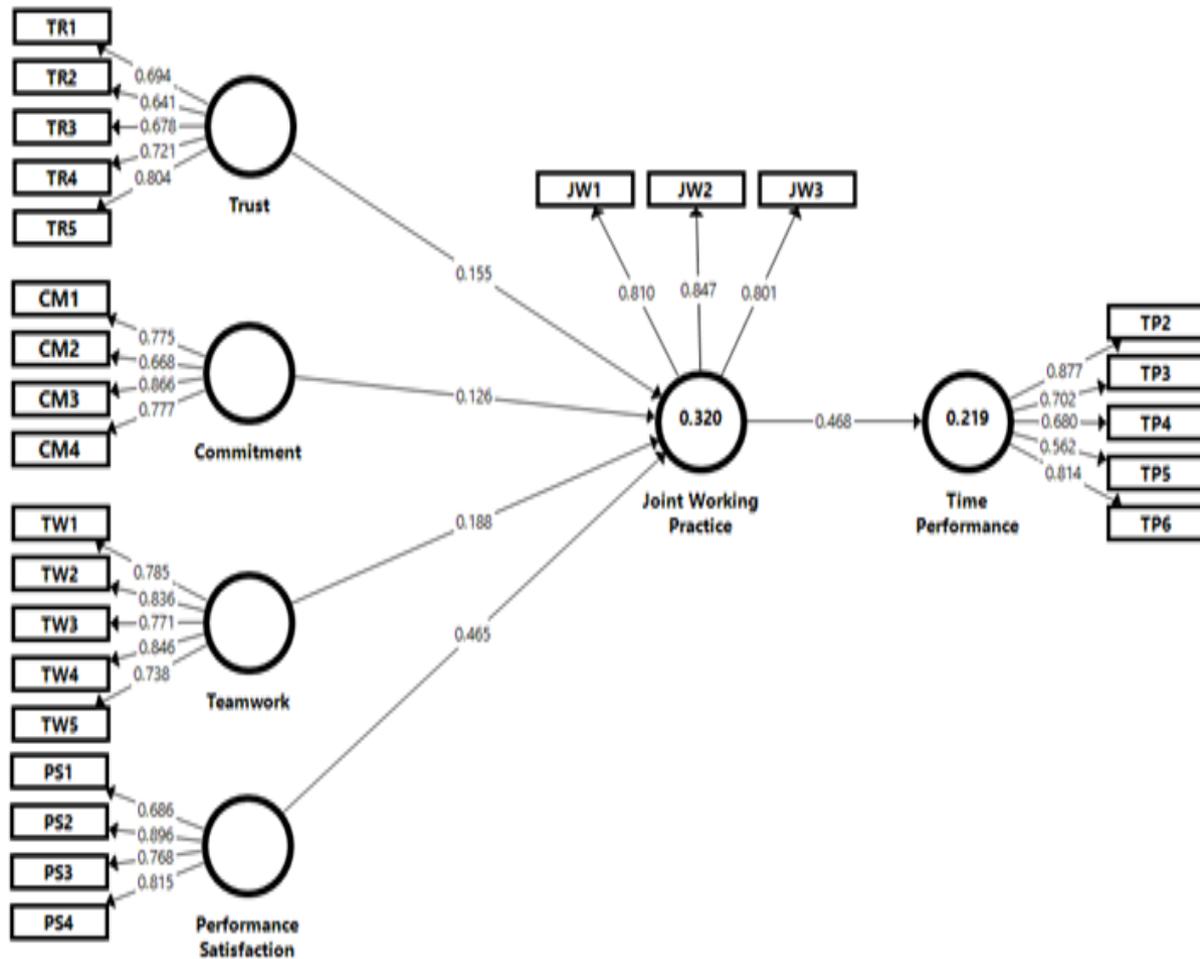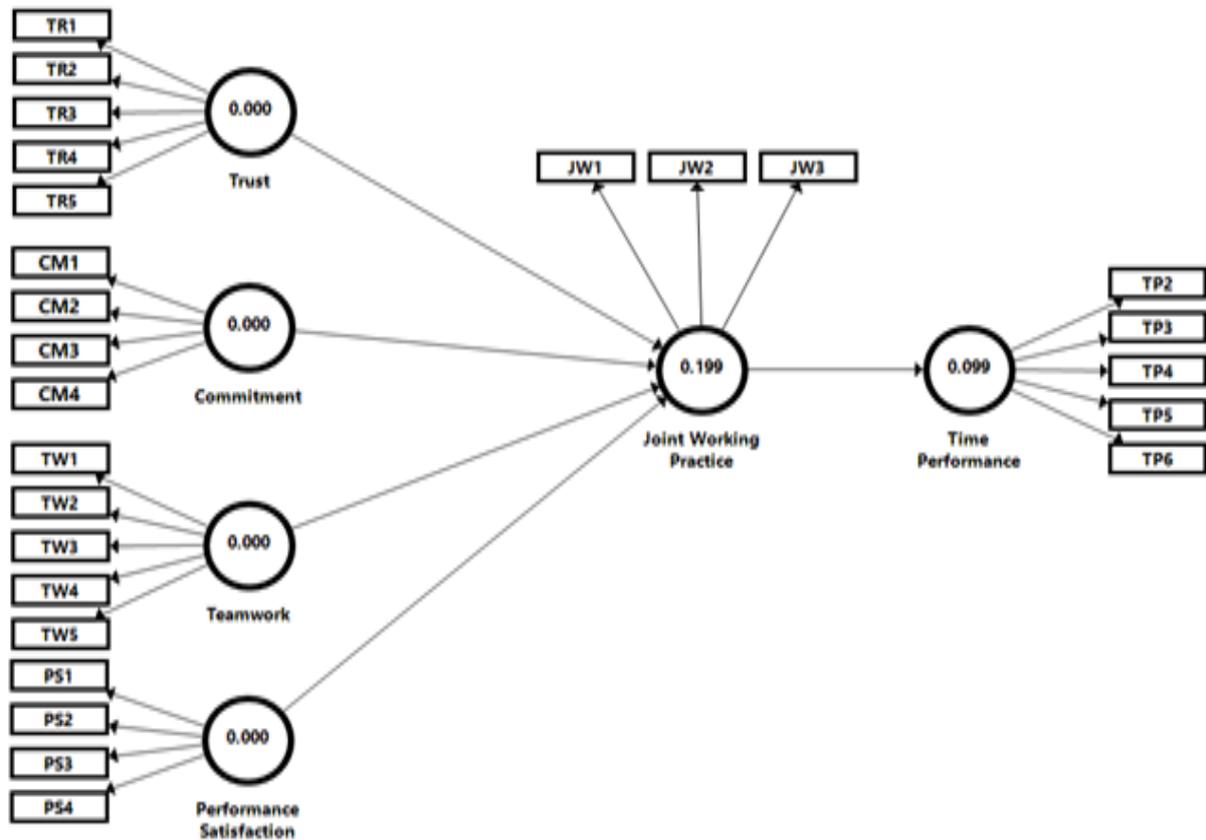**Figure 3.** PLS-Path analysis of R-square values (n=245)



**Table 6:** R-Square value and Q-Square value (n=245)

| Endogenous Variable | R-Square | R Square Adjusted | Q-Square |
|---|---|---|---|
| Joint Working Practice | 0.320 | 0.309 | 0.199 |
| Time Performance | 0.219 | 0.216 | 0.099 |

**Figure 4.** Predictive relevance - Joint Working Practice (MV) JWP (Q2=0.199>0); (DV) Time Performance (Q2=0.099>0)



## Discussion

This paper was conceived to have three main study objectives which was further described through testing of nine (9) different hypotheses. First, to discuss and deliberate on how supply chain RQ described by four main constructs (trust, commitment, teamwork and performance satisfaction) impacts on joint working practice (JWP); second, to investigate the impact of JWP on time performance (TP) and finally to examine the mediating effect of JWP on a relationship between SCRQ and TP.

Regarding the first objective, this study hypothesized that SCRQ (mainly described by constructs as; trust, teamwork, commitment and performance satisfaction) have positive direct effects on joint working practice (H1, H2, H3, H4). The results of the direct effect (table 4) indicates that hypothesis (H1, H2 and H4) have been supported. This implies that trust, teamwork and performance satisfaction have been revealed to act as main antecedents of JWP in construction. Furthermore, the results do not provide empirical evidence on the direct influence of commitment on joint working practice. Joint working has been described as a key indicator and strategy of enhancing RQ in construction (Meng, 2012). This

substantiate the opinion of Jelode et al. (2015) who submits that joint working is associated with joint problem solving achievable through joint evaluation, benchmarking and continues improvement which create a better relationship among the supply chain partners.

On the second objectives, hypothesized by H5, we expected joint working practice to positively influence time performance of MIPs. The statistical test of the direct effects (table 5) revealed empirical evidence that time performance could be influenced by joint working practice. In line with literature, there exist significant association between time performance of construction project and joint working practice. This implies the significance of joint and collaborative working practice in achieving time efficiency in project delivery (Meng 2012).

Regarding the third objective, our study further found that joint working practice mediates the impact of SCRQ mainly trust, teamwork and performance satisfaction on timely delivery of construction project. This reports the hypothesized relationship which described the sixth (H6), seventh (H7), eight (H8) and ninth (H9) hypotheses of this study. Interestingly, the study did not support all the components of the hypothesis. Although H6, H7, and H9 have been supported, the results of the indirect effect (table 6) revealed that joint working practice has a substantial mediation effect on a relationship between performance satisfaction and time performance (H9) then the indirect mediation effect between trust and time (H6) and between teamwork and time performance (H7). Additionally, there is no empirical evidence of mediation effect of joint working on the impact of commitment on time performance (H9). The study therefore provides an empirical result that provides supply chain partners with insights into how they might improve time performance of their projects by focusing on joint working strategies to improve the quality of the SCR.

In line with the existing literature, and as a direct consequence of achieving considerable time performance, managers must ensure that at the supply chain level, the concept of joint decision making (Chan et al., 2004), collective problems solving strategy (Cheng, Li, & Love, 2000; Jelode et al., 2016; Rahman & Kumaraswamy, 2008) and collective efforts for continuous improvement (Jelode et al., 2016; Larson, 1997; Meng, 2012) are highly embraced, encouraged and promoted.

Although previous literature provides conceptualisation of the constructs for RQ, joint working and time performance, there is insufficient investigation on the role of joint working practice as a variable mediating the relationship between SCRQ and time performance. This study therefore confirmed the previous research findings that relationships quality defined by its attributes and strategies, enhanced performance of construction projects. The study finally and empirically contributes to the existing literature by providing a holistic perspective on time performance of construction projects in Nigeria. Although trust, teamwork and performance satisfaction are good antecedents for time performance, this study provides an

overwhelming evidence for more effective and efficient performance when their effect were intervened by joint working practice of the supply chain partners.

**Conclusion**

The study provides some empirical evidence on attributes of RQ with emphasis on their effect on timely delivery in construction. The study suggests that trust among project parties; teamwork capability and performance satisfaction could lead to time performance through joint working practice. On the other hand, party's commitment to project objectives did not in any way influence time performance. The results also suggest a direct influence of trust, teamwork and PS on joint working practice as well as significant influence of JWP on time performance. Without joint working practice, project teams often face difficulty in achieving time certainty. This research therefore corroborates the finding which postulated that joint working practice has positive influence on project performance (Baiden & Price, 2011; Bosch-Rekveldt, 2011 cited in Suprapto et al., 2015; Chan et al., 2004; Meng, 2012; Rahman & Kumaraswamy, 2008; Suprapto et al., 2015).

A conceptualised literature on RQ identified the main attributes for RQ (Jelodar et al., 2016). This study further confirmed and signified the efficacy of each of the attributes of RQ as it influences JWP and TP in construction. Specifically, trust, teamwork and performance satisfaction contribute positively to joint working practice as well as time performance. Additionally, the relatively stronger influence of JWP and PS compared to trust and teamwork on project performance justify the focus on collaborative practice as significantly influential when improvement in time performance is required (Meng, 2012). The study finally showed that three (3) of the antecedents of RQ (trust, teamwork and PS) explained 21% variation in the project time performance while the remaining 79% is explained by the variables or other aspects outside the model. This indicates the importance of these variables in timely performance improvement of construction projects in Nigeria.

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